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ABSTRACT

This curriculum guide presents lesson plans for outdoor and environmental education at the Cispus Learning Center, a camp in Randle, Washington. Objectives for the Cispus experience cover student learning of content, socialization as a team member, development of aesthetic awareness of nature and art, and increased physical wellness. Lesson plans include focus, group size, time and materials required, handouts, physical setting, and activities. The lesson plans are arranged in the following categories: (1) behavior and etiquette (trail safety, outdoor etiquette, litter maintenance, dining hall procedures and etiquette, and flag etiquette); (2) geology and soil (geology of the Cispus area, cave visits, rock identification, and soil pit study); (3) orienteering and trails; (4) water and wetlands (stream flow, water forces, creek study, human impact on wetlands, water investigation, and wetlands development); (5) investigation and identification of trees, plants, and flowers; (6) animals, insects, and interrelationships (birds, worm composting, cyclic relations, human impact on wildlife, aquatic insects, bats, food chain, animal specialization and adaptation, organism interdependence, story telling, and owl pellet dissection); (7) aesthetics and sensory exploration, adaptation, and experimentation; (8) creativity and imagination (journal and letter writing, campfire programs, nature poems, sketching, and handicrafts); (9) outdoor survival, edible and medicinal plants, and nutrition; and (10) conservation (population factors, soil erosion, environmental careers, pollution, and forest use). (SV)

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ED 440 809

The Cispus Experience

A Curriculum Guide
for the
Cispus Learning Center

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Cispus Learning Center

The Cispus Outdoor School

The goal of the Cispus experience is to foster an enduring understanding and appreciation of the physical and biological world, while developing skills and attitudes to affect the individual's life long learning and decision making process.

Objectives for the Cispus Experience

1. CONTENT

   The student will understand:

   a) The cyclic interrelationships between earth, man, water, air, plants and animals.

   b) The content through application of acquired knowledge/skills by displaying appropriate sketched, written, and oral responses to inquiries by the instructor, and by generating increasingly sophisticated questions.

2. SOCIALIZATION

   Using the various camp and classroom settings and through guided practice, the student will be successful in developing and demonstrating the following:

   a) a sensitivity to values and feelings of others.

   b) a willingness to participate as a team member (or leader) to complete tasks.

   c) a positive personal growth change involving expression, posture and written/oral responses and

   d) an appreciation and respect for rules and regulations through appropriate behavior.

3. AESTHETICS

   Through experiences and related activities the student will develop an increased awareness and appreciation of nature and art expressed in visual, musical, written and performed activities.

4. PHYSICAL WELLNESS

   The student will achieve higher levels of health and success:

   a) by participating in physical activities within the content, socialization, aesthetic, and recreational choices at camp and

   b) by using sound nutritional practices.

THE CISPUS EXPERIENCE

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The Proper Manner

behavior and etiquette

1-2-3 LEFT-RIGHT-LEFT

Focus	To use discussion, lecture, and guided practice techniques to enhance safety during the physical activities of hiking along and across rural roads and trails during the day and after dark.
Group Size	Entire class
Time Required	10-20 minutes
Materials	Flashlight(*s*) Hiking shoes/boots Durable clothing (*suitable for the weather*) Handout: ***Rules of the Road***
Physical Setting	Roads and trails in and around Cispus

Process

1. Explain trail rules early on your first day at Cispus. You will need to explain several of the hiking rules: the buddy system, counting off, safely crossing a rural road, special rules for after dark, trail etiquette--including spacing, shortcuts, switchback trails, walking on logs, running, open knives, and walking sticks. (Explanations in the handout)

2. After reviewing the rules and giving a copy to each student, take the class on a hike/walk and practice what you have learned.

Rules of the Road

BUDDY SYSTEM: Because it's harder to lose two people than it is a single person, the buddy system requires that each student have a partner and that they stay together during hikes. If you do become separated from the group or get hurt, then you and your buddy will be there to help each other out.

COUNTING OFF: If you have a large number of people, it's easy to keep track of who is present if everyone has a number. When the instructor needs to check, you can call out your numbers in order. If anyone's missing you'll know right away. To help identify who's gone, you also need to know who has the numbers before and after yours.

CROSSING ROADS: The roads around Cispus are frequented by logging trucks and cars. It is imperative you cross quickly. Teachers should lead everyone in single file along one side of the road. When the road is clear, the teacher gives a pre-arranged signal and everyone walks quickly, straight across the road.

AFTER-DARK WALKS: Walks after dark require flashlights on trails and special care on road crossing. Using the buddy system is particularly helpful in keeping track of everyone.

TRAIL ETIQUETTE:

•On switch back trails, be careful not to roll something down on the person below.

•Short cuts cause erosion (especially on switch backs), create new trails which are unwanted, impact wildlife, and can stir up hornets' nests.

•Holding a branch aside for someone behind you seems like a nice thing to do but it is safer to be responsible only for watching the trail ahead of you (just make sure not to let the branches snap back behind you).

OTHER SAFETY CONSIDERATIONS:

•Walking on logs is not safe. There are sharp branch stubs to fall on, the bark tends to slip off and walking on nurse logs harms the young plants and trees growing there.

•Running on trails and having open pocket knives while walking, greatly increase the risk of injuries.

KEEP IT GREEN

Focus To teach and encourage ethical outdoor conduct. *Can be easily combined with **Litter Busters***

Group Size Entire class

Time Required 2 hours

Materials
Enthusiasm
Willingness
Responsibility
Handout: ***Trail Conduct***

Physical Setting Angel Falls Trail

Process

INTRODUCTION:

The Cispus Learning Center is an incredible facility with a wealth of both indoor and outdoor resources to use in creating effective learning experiences for children. Cispus is utilized by school districts from across the state year round. All but two weeks per year, Cispus hosts groups averaging 300 students, numerous staff members and counselors each week. This works out to approximately 15,000 to 20,000 human visitors per year to these natural settings. Because of the intense usage these areas receive it is essential that teachers and students, via teacher guidance, conduct themselves in ways that minimize impacts on the land. Often teachers themselves are not aware of the relatively new accumulation and concept of low-impact, behavior information that is beginning to surface as more high usage areas are being spoiled by the cumulative effects of recreators.

This lesson is not a holier-than-thou-sermon on outdoor behaviors. It is a plea for teachers to assume roles as stewards of the environments where they are facilitating potentially life-altering experiences for children. Teachers need to know, teach, follow, and explain the following outdoor behaviors. If you realize and feel good about doing your part, it will help to insure the longevity and natural integrity of Cispus for children in the years to come, for them to enjoy and learn from.

LESSON:

1. Take the class on a trail walk and see if you can find samples of poor outdoor ethics along the trail (Angel Falls/Burley Mountain Trail provides all the components). Use the Trail Conduct list as a guide and see if there are deviations from the trail, cut switchbacks, garbage, etc.

2. At each example, discuss with the students why this is an example of poor outdoor ethical conduct. Discuss what the long-term effects of not following trail rules might be, and how long it may take wildlife and vegetation to recover from human interference. Consider the cumulative effects of seemingly harmless actions.

3. If a student deviates from these behaviors, use the situation as a potential learning experience and not a disciplinary event. Motivating students to consider their effects upon landscapes and discussing mistakes can be a very rewarding experience.

TRAIL CONDUCT

Stay on trails!

One person deviating from the trail may not seem very important, however the cumulative impact of trailblazers has affected many national parks and will ultimately do the same to Cispus. Many areas have delicate plant communities that cannot endure even one disturbance, much less year-round trompings.

Trudge through mud puddles, don't skirt them!

Walking around puddles in order to keep dry ultimately widens the trails and destroys vegetation.

Don't cut switchbacks!

Paths are created to concentrate human intrusions into manageable areas. By taking direct paths up steep inclines, you encourage soil erosion and the destruction of whole hillsides from cumulative effects.

Keep track of trash!

No one can argue that littering is an ugly behavior that can ruin the beauty of hiking trails. If you have snacks in packaging, collect the garbage afterwards and pack it out. People can sometimes be forgetful, so help them to be responsible. If you see garbage take it out with you.

Don't leave food or feed animals!

Animals can rapidly grow accustomed to human help in obtaining food and will be unable to fend for themselves in the wild. Some animals cannot digest human food effectively--a piece of chocolate, for example, can kill a squirrel. Orange peels and apple cores will biodegrade, but take long periods of time to do so. With the overwhelming numbers of visitors it is very important to pack everything out.

Don't take any souvenirs!

Picking a flower or fern frond may not seem very damaging. However, imagine what the areas surrounding the trails would look like if everyone of the 15,000 visitors took one trinket home . Many plant communities are also in danger of becoming extinct, taking them home for decoration only increases this potential.

Urinate at least 200 ft. away from water sources!

The cumulative effects of urinating by rivers and lakes can quickly degrade waterways upon which wildlife depend.

Use common sense!

If you are unsure about doing something, imagine having 15,000 to 20,000 people behave this way and what the potential effects would be, before making your decision.

LITTER BUSTERS

Focus	To increase student awareness of litter, and empower them by helping to rescue the forest.
Group Size	Entire class
Time Required	30 minutes
Materials	Small brown lunch sacks (*1 for each student*) One large garbage bag (*for bottles and cans*)
Physical Setting	Anywhere on Cispus grounds, or along trails

Process

1. Hand out the bags and space the group out along the road or trail to pick up litter. One or two students will carry the large garbage bag for bottles and cans. Another option is to split the class into small groups and assign clean-up sections.

2. Once a student's bag is full they present it to the teacher, who gives them a Cispus logo button (provided by Cispus). This button is an outward sign of the students' involvement and concern for the forest.

Discussion:
Ask the students:

> Why do people litter?
> What options can they choose instead of littering?
> What damage can litter do to the forest plants and animals?
> What lifestyle changes can we encourage to limit littering?

Extension:
If a student expresses frustration in seeing litter, offer that student and others the opportunity to make a difference.

1. Vow to pick up litter whenever you see it. (Be an example and an active helper!)

2. Get litter bags for all the family cars and encourage their use.

3. Organize a project to clean up your school grounds.

4. Encourage a school club or group to maintain a portion of the local highway.

MR. & MS. MANNERS

Focus	To prepare students for family style eating. *This is a lesson for students to complete before they come to Cispus.*
Group Size	Entire class
Time Required	20-30 minutes
Materials	Place settings & food for role play
Physical Setting	Standard classroom, cafeteria for role play
Process	1. Instructor leads discussion or lecture with students about table manners. For follow-up, students may role play the procedures during lunch.

Dining Hall Do's

Hats are not worn in the dining hall.

BEFORE THE MEAL:

1. Set-up crews take out tables and set them with dishes and silverware (pictures on the dining hall wall show how they should be set).
2. Also set out salt and pepper, milk, water pitchers, and glasses.

MEALTIME:

1. Meals at Cispus are served family style. Everyone needs to remain standing until the dining hall leader seats you. Host(ess) and Jump-Up sit at the head of the table (nearest kitchen) opposite each other.
2. The Jump-Up brings the serving dishes of food to the table.
3. The Host(ess) takes one helping of each food and passes the serving dish to the person sitting next to him/her.
4. In turn, each person at the table serves himself/herself and passes the serving dish on to the next person.
5. After everyone is served, the Host(ess) takes the first bite. Everyone else may start eating after the Host(ess) has started.

THINGS TO REMEMBER:

1. Take a single serving of food when it is passed.
2. Pass the serving dishes on quickly and quietly.
3. Put your napkin in your lap before you begin eating.
4. Wait until the Host(ess) takes the "first bite" before starting to eat.

SCRAPING AND STACKING

Focus	To prepare students for after-meal clean up. *This is a lesson for students to complete before they come to Cispus.*
Group Size	Entire class
Time Required	1 hour
Materials	Poster paper or tag board Drawing materials to make posters
Physical Setting	Standard classroom

Process

1. Instructor leads class discussion with students about scraping and cleaning dishes in the dining hall after a meal has been served.

2. Posters generated will be brought to camp for the week students are attending Outdoor School. One poster is hung in the dining hall. The remaining posters are hung in the dorms.

AFTER THE MEAL:

After everyone at the table has finished eating, follow these procedures for cleaning the dining area:

1. During clean-up the students at the table sit quietly helping as needed. The Jump-Up brings the scrap can and spatula to the table.

2. People sitting at the table pass their individual plates and utensils to the Host(ess). The Host(ess) is the student sitting at the head of the table, across from the Jump-Up.

3. The Host(ess) scrapes each plate before it is stacked. The Jump-Up takes the plates to "Hobart's Hideaway" the dish washing room, as soon as they are scraped and stacked.

4. Silverware is collected, sorted and placed in an empty bowl or plate. Stack them with the handles pointing in the same direction.

5. Bowls, glasses, cups etc. are passed to the Host(ess),who dumps, scrapes and stacks them.

6. Empty milk cartons are flattened. The Jump-Up puts all the milk cartons, napkins and paper products in the paper barrel located adjacent to Hobart's Hideaway; the scrap can goes there too.

7. During clean up, the Jump-Up takes the left over food to the kitchen, the dirty dishes and utensils to the Hideaway, and gets a sponge from the counter.

8. The Host(ess) wipes down the table with the sponge.

9. Students help each other to fold and put away their table. Then, the Host(ess) sweeps the area where the table was. If it is the last meal (before returning home) the floor needs to be mopped.

10. Students remain at their table, or together in the dining hall until they are dismissed by the dining hall leader.

YOU'RE A GRAND OLD FLAG

Focus To involve students in a ceremony that will instill patriotism through songs, pledges, poetry reading, and selected pieces of literature.

Group Size Entire class

Time Required 15 minutes

Materials
The U.S. Flag
Patriotic songs & music
Collected poems or literature reflecting American history
Optional:
Cassette player
Guitar
Song-leader

Physical Setting Area surrounding the Cispus flagpole

Process

INTRODUCTION:
The flag ceremony could be considered one of the most meaningful activities within the course of your outdoor experience. This short period of time can be an opportunity to instill respect for our country in the hearts of your students. Here's a brief outline of how a flag ceremony can be presented:
-Sing or play a patriotic song
-Ask the assigned group to present the colors
-Raise/lower the flag
-Read a chosen passage of literature
-Lead the Pledge of Allegiance
-Dismiss the group

ACTIVITIES:
1. To appoint an adult as the flag ceremony leader is very helpful. Their responsibilities would include assigning each counselor the day and time in which they and their cabin group will be the "color guards" (the group to raise or lower the flag). They would also be in charge of song leading, poems, and literary reading; as well as training the counselors how to fold the flag. The counselors will teach the kids what they learn.

2. For the flag ceremony counselors are asked to lead their groups quietly into a large circle surrounding the flagpole. This allows time for reflection.

3. Ask everyone to remove their hats out of respect for their flag.

4. The assigned color guards approach the flagpole and position themselves in two parallel lines facing each other.

5. The color guards either present or lower the flag as described below.

6. Once the flag has been lowered at the end of the day, a gentle song or poem is appropriate to retire the flag. The group can then be dismissed to quietly walk to the dining hall or to the next scheduled event.

Raising the Flag:

- The counselor presents the flag to the color guards. They unfurl the flag, with the stars close to the flagpole.
- The counselor prepares the ropes and clips on the flagpole.
- The eyelet in the stars of the flag should be clipped on first to make sure the flag is right side up.
- The counselor hoists the flag up, BRISKLY!
- The counselor secures the rope onto the flagpole.

Lowering the Flag:

- Repeat the process described above, however, the flag is traditionally lowered down very slowly and respectfully.
- When the flag is within the grasp of the color guards, they once again unfurl the flag with the stars close to the flagpole.
- The counselor secures the rope onto the flagpole.
- The color guards fold the flag so that the stars are exposed.
- The color guards present the flag to the ceremony director.

Folding the Flag of the United States of America:

1. Fold the long sides together so that the flag lies long and narrow, with the stars facing downward.
2. Repeat the fold
3. At the opposite end from the stars, begin to fold triangles by moving one corner up and across the flag until it lines up on the outer edge of the flag. You should see a distinct triangular shape. Repeat the pattern by folding along the base of that triangle, always lining up one side of the triangle with the straight edge of the flag.
4. Finally, you will have a thick triangular shape with a small excess of flag on the underside. Take that excess and tuck it into the envelope-like slot found in the fold of the triangle. You should end with a complete triangle with stars exposed.

SOUP'S ON

Focus	To learn Dining Hall set-up and duties during meals. *This lesson is for students to complete before coming to Cispus.*
Group Size	Entire class for presentations Groups of 12 for role play Groups of 4 for posters
Time Required	30 minutes to present each activity and role play 1-2 hours to make posters
Materials	18x24 construction paper for posters and dining hall floor plan 12x18 construction paper posters 9x12 construction paper for tables Mini-stickers, stars, etc. to illustrate designated seating Pens, pencils, crayons Total number of participants for Activity 4 Paper plates Handouts's: ***Soup's On*** *duty roster for teacher information* ***Dining Diagrams*** *(make transparencies from drawings)*
Physical Setting	Standard classroom
Process	**Activity 1: LECTURE** Use transparencies to explain the designated seating and jobs . **Acitivity 2: ROLE PLAY** Arrange student desks or have students sit on the floor to role play seating arrangements, serving, and passing paper plates. **Activity 3: TABLE POSTER** With 9x12 or 12x18 construction paper, make a scale model poster of one table set up with 12 place settings and designated seating. **Activity 4: DINING HALL POSTER** Divide into groups of 4. Use 18x24 construction paper to make a scale model poster of the dining room and tables set to seat all students, counselors, staff, and visitors. Use the mini -stickers or other symbols explained by a legend to illustrate seating and passing of dishes. **Activity 5: DISPLAY** Display finished posters in classroom and/or take them to Cispus to display in the dorms or the dining room.

SOUP'S ON Duty Roster

Host:

1-Before the meal, choose a guest to sit across from you during mealtime.

2-Take your place at the end of the table close to the kitchen, so that the kitchen will be on your left.

3-Aid in seating late-comers by raising one hand and showing, with extended fingers, the number of empty places left at your table.

4-Pass food to your guest, who serves him/herself, and then passes the dish down the table. The host is the last one at the table to be served.

5-Refill dishes by giving directions to the Jump-Up.

6-Clean-up by scraping and stacking all the dirty dishes and sending the plates to the dishroom immediately.

Jump-Up:

1- Sit beside the Host

2- Follow the Host's directions to bring food from the kitchen.

3-Get scraping can and spatula from clean-up counter and take scraped dishes to the dishroom.

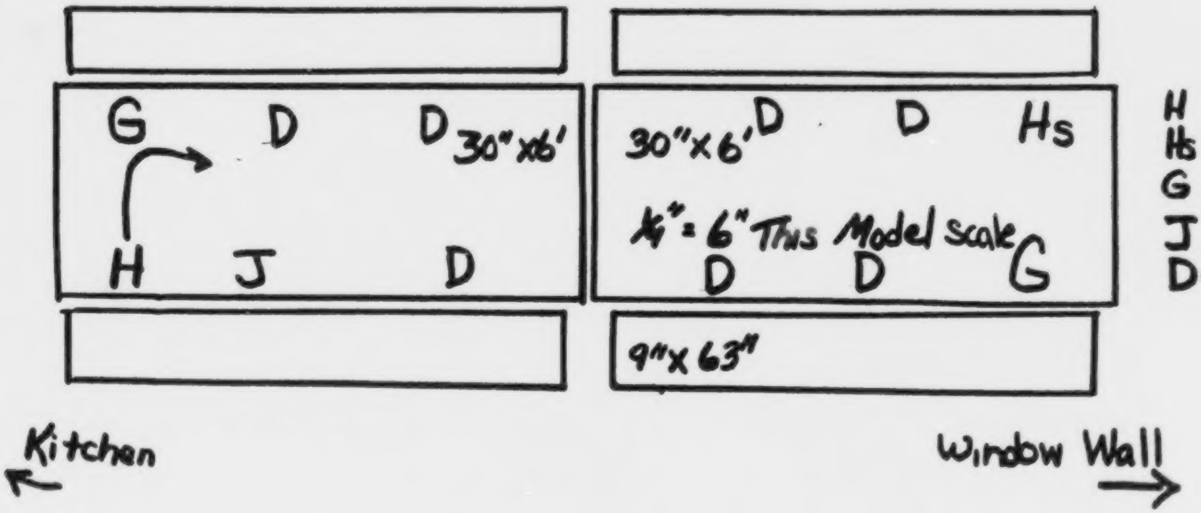
Hostess:

1- Before the meal, choose a guest to sit directly across the table from you.

2- Take the place at the far end of the table, on the side opposite from the Host. The windows will be on your left.

3-Start the meal by taking the "first bite" after everyone at the table has been served.

Sample Dining Hall Diagram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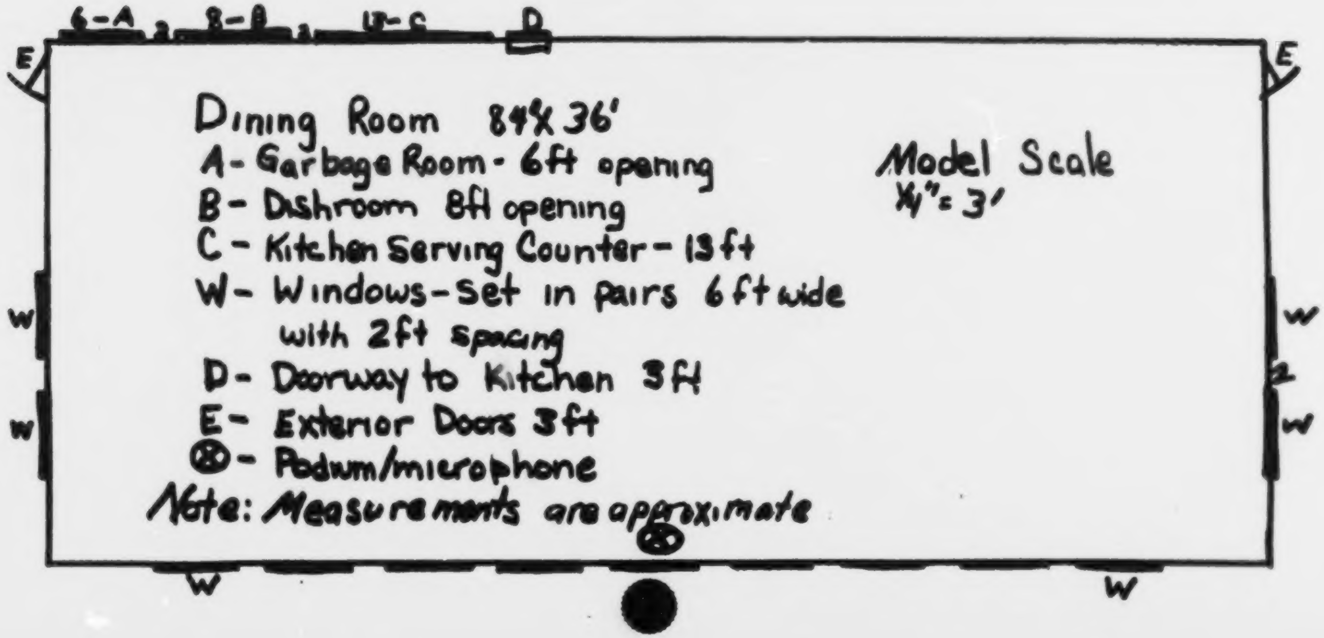
9"x63"
Kitchen
Window Wall

H Host
Hs Hostess
G Guests
J Jump-Up
D- "Diners" or P "place setting"


6-A
2
8-B
2
13-C
D
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Dining Room 84'x 36'

A- Garbage Room - 6ft opening
B- Dishroom 8ft opening
C- Kitchen Serving Counter - 13 ft
W- Windows - set in pairs 6 ft wide
with 2ft spacing
D- Doorway to Kitchen 3 ft
E- Exterior Doors 3 ft
⊗- Podium/microphone

Note: Measurements are approximate

Model Scale
¼" = 3'

Under Your Feet

geology and soil

CISPUS ROCK HOUNDS

Focus	To explore the local geology, rock types, volcanoes, and stratigraphy.
Group Size	20 students
Time Required	2 hours
Materials	4 rock hammers 4 pairs of goggles 4 magnifying glasses Rock samples
Physical Setting	Mt. St. Helens room, soil pit, and the Cispus River

Process

Activity 1: INSIDE INVESTIGATION

1. Begin with a discussion of Mt. St. Helens. Possible topics would include eruption history, volcano type (Stratovolcano), and the social implications involved with living near a volcano.

2. Next, discuss Igneous, Sedimentary, and Metamorphic rocks. Have samples of each category and pass them around the room. Since the Cispus area is composed mostly of Igneous rocks, spend some time talking about extrusive and intrusive rocks, and cooling time in relation to crystal size (cooled fast = small crystals, cooled slow = larger crystals; *refer to **ROCK 'N ROLL***). Observe different crystal sizes under the magnifying glass.

3. Then, move the discussion to stratigraphy and the formation of sedimentary rocks. Most children think that there is only soil covering the earth, so the goal here is to convey that the earth is constantly changing due to what falls upon the land (you may wish to conduct this portion of the discussion at the soil pit to provide examples).

4. Before leaving the Mt. St. Helens room, encourage the students to explore the displays there. Have them tell the group something they learned from the displays.

Activity 2: SOIL PIT STUDY

1. The class is now ready to go outside. The first stop should be the soil pit to observe the stratigraphy of the area. One aspect to discuss might be how catastrophic the 1980 eruption of Mt. St. Helens was and how small of a layer of ash it left. Compare this layer with the layer of ash left by the 1708 eruption of Mt. St. Helens and have the students imagine the magnitude of the 1708 eruption. Use the soil pit to illustrate points from your discussion.

Activity 3: ROCK RATIONALE

1. Take the class to the river to explore the many different kinds of rocks. Notice that most of the rocks are round and not angular. Have the students use the rock hammer to break open rocks and observe their crystals. A discussion on safety is very important here (refer to ***ROCK 'N ROLL***).

2. Back at the classroom, have the students recall what they learned. There are many approaches to the subject of geology at Cispus, whichever you choose, have fun!

MYSTERY OF THE MISSING LINK

Focus To use lecture, reading, and creative problem solving in understanding the impact vandalism has on archaeological sites. And to develop an appreciation for the laws and regulations guiding use and preservation of these sites.

Group Size 12 students

Time Required 1 hour (*includes travel time to and from Layser cave*)

Materials
Flashlight
Writing tools
Handout: ***Questions Of The Missing Link***

Physical Setting Interpretive displays outside the entrance to Layser Cave and the areas inside the cave.

Process

Activity 1: GETTING THERE
1. Turn left at the main entrance to Cispus. At the stop sign turn left onto road 28, crossing Yellowjacket Creek and the Cispus River.

2. At the junction of road 23, turn left, back toward Randle, and proceed about 2 miles until the Layser Cave road. From there it is about 1 1/3 miles up the road to the parking area. The trailhead is on the right hand side of the road.

Activity 2: THE LESSONS
1. Stop and read the interpretive sign, then proceed directly to Layser Cave (when the path forks, take the one to the right). Before entering the cave read all the interpretive displays--especially the one detailing the vandalism and theft that occured there, and the sign explaining the laws relating to these crimes. Then, enter the cave, and complete the rest of the questions in this lesson. Allow about 2-3 minutes to return to the vehicle, the Cispus Center is about 9 minutes away.

Activity 3: FOLLOW UP
Have the students look at the display in the dining hall and discuss the exhibit.

Questions Of The Missing Link

WHAT happened at Layser Cave shortly after its discovery?

WHAT area of the cave was affected? **HOW** large an area was impacted?

STATE briefly what the law says about this sort of activity.

As a result of the crimes carried out here, **HOW** has our understanding of past events here been impacted?

WHO owns this property?

HOW do you feel about this loss?

WHY is the scientific excavation of archaeological sites the best way to analyze the past?

WHY is it wrong to collect artifacts on Public Lands?

WHAT should you do, if while visiting an area on Public Lands, you find some arrowheads, or other such artifacts?

WHAT are some other occupations essential to understanding prehistoric times?

ROCK 'N ROLL

Focus To use geological field study as a recreational activity.

Group Size Entire class

Time Required 2 hours

Materials

Rock samples
(*igneous*: granite and obsidian;
sedimentary: sandstone and shale;
metamorphic: marble and onyx;
local: iron pyrite/fool's gold and agate)
Handout: ***Rock 'N Roll information sheet***

Rock hammer
Sifting pans
Safety goggles

Physical Setting Indoor or outdoor classroom, and Yellowjacket Creek gravel bar

Process

Activity 1: LECTURE & DISCUSSION
1. Pass around the rock samples, showing the three categories of rocks. Show the effect of fast cooling vs. slow cooling on the size of crystals in a rock sample. Show samples of iron pyrite and native agate. (Refer to the information sheet, or use it as an overhead visual).

2. Explain procedures for safety and rules about keeping rock samples from the creek.

Activity 2: FIELD STUDY
1. Hike to an outdoor classroom on the Yellowjacket Creek bank.

2. Demonstrate how to use a sifting pan and how to determine the difference between real and fool's gold. Then, have students look for agate and fool's gold.

3. Set-up a station where an adult or high school student will break open rocks for younger students (see attached safety guide). This activity will leave you feeling *rocky*. Don't take safety for *granite*!

Rock 'N Roll

information sheet

Fast vs. Slow Cooling in Crystal Formation

Generally rocks which cool rapidly have smaller crystals than those which cool slowly. To show this, go to your local monument carver and get samples of different kinds of granites which show different sized crystals. Monument carvers generally have shards that they are delighted to unload. Marble might also be available.

Safety Considerations:

Breaking rocks can be hazardous. There are safety glasses available from the Cispus staff; although, not enough for everyone. For safety, there should be one rock-breaking station. It should consist of one large, flat rock to act as the anvil, and one older student or adult stone-breaker with safety glassses and a rock hammer.

The breaker needs to organize the students so that he or she receives only one rock at a time. When the breaker calls out "EYES!", that is the signal for the students to turn their backs to the breaker and protect their eyes from flying rock chips. Be sure to have band-aids for the breaker to cover cuts on hands from flying rock chips.

Keeping Rock Samples:

Students should leave most rocks behind. Our rationale for allowing students to take samples from Cispus is that we bring in agate to supplement the few agates that occur naturally here, and the fool's gold samples are being replenished annually by rocks washed down Yellowjacket Creek. We tell the students to take only one small rock of these two types so that the bus doesn't get a flat tire, and so that others can have the fun of finding rocks too. This way they can have mementos of their stay at Cispus, without depleting the rock sources.

WALK BACK IN TIME

Focus To use guided inquiry and simulation activities in exploring the past.

Group Size 10 students

Time Required 1.25 hours (*includes traveling time to and from Layser Cave*)

Materials
Flashlight
Writing instrument
Handout: ***A Step Back In Time***
Archaeologist (*opt.*):
•call Randle Ranger Station (206) 497-7565 for assistance; they can bring excavated artifacts from Layser Cave and demonstrate the use of an at-latl
•call Larry Nelson (206) 497-5630, he's a local Deputy Sheriff, amateur archaeologist, and professional flint knapper; he gives a great slide show presentation and flint knapping demonstration.
BE SURE TO CALL SEVERAL WEEKS IN ADVANCE SO THEY CAN SCHEDULE YOU IN!!

Physical Setting Layser Cave

Process

GETTING THERE:

1. To take the students to Layser cave, turn left at the main entrance of Cispus. At the stop sign, turn left on road 28, crossing Yellowjacket Creek, then the Cispus River.

2. At the junction of road 23, turn left (back towards Randle), and proceed about 2 miles to the Layser Cave turn-off on the right hand side (there are signs along the road indicating the turn-off). Travel up this gravel road 1 1/3 miles to the parking area. The trailhead is on the right hand side of the road.

THE LESSON:

1. Stop at each interpretive display. This activity has questions for each stop.

2. When the trail forks, take the left path for another interpretive display. Then go right and up to the entrance of the cave. Be sure to examine the displays before entering (especially the warning--see ***Mystery Of The Missing Link***, for a related lesson).

A Step Back In Time

1. **WHAT** is an at-latl? **WHAT** is its purpose?

2. **HOW** accurate is this tool?

3. **WHY** weren't a bow and arrow used?

(proceed to the next stop, be sure to turn left when the trail forks; let an adult lead)

4. **WHY** would this be a good spot for a camp?

5. **WHAT** landmarks do you recognize?

(proceed to the right to the entrance to the cave; read and examine all the displays before entering the cave)

6. As you enter, pretend that you are stepping back 1000 years in time with each footstep. In 5 steps you are inside the cave, and 5000 years into the past. Close your eyes and picture yourself and your family living here in the summer 5000 years ago. In the space below **MAKE A SKETCH,** showing where the various activities of your family took place (sleeping, eating, cooking, tool making, meat drying, hide preparation, clothes making, singing, dancing, and story telling).

8. **HOW** do we know that a family lived in Layser Cave?

9. **WHY** didn't they stay here year round?

10. **WHERE** else would they have gone to gather other types of food?

11. **LIST** at least 5 artifacts found during excavation at Layser Cave.

12. Layser Cave was named for the man who made its discovery. If you had been head of the family living here 5000 years ago, **WHAT** would you have named your summer home?

13. As you leave the cave and return to modern times, **HOW** has the landscape changed? **WHAT** did nature change? **WHAT** did man change?

WHICH ROCK IS IT?

Focus To learn about classification and identification using specific traits.

Group Size Entire class

Time Required 30 minutes

Materials 4 white, kitchen-sized garbage bags (*per group*)

Physical Setting Along the Cispus River or Yellowjacket Creek

Process

Activity 1: GROUP PROPERTIES
small group activity and class discussion

1. Divide the class into groups of 4-7. Mark off a 2 ft. square area for each group.

2. Students in each group determine criteria and sort rocks from their area into 4 groups, placing each group on a separate bag.

3. Gather the class at each station. Have group members explain their criteria for sorting, and how they decided upon it.

Activity 2: PET ROCK
individual project and group follow-up

1. Each student selects a favorite rock and writes a description of its properties.

2. Give each rock a code letter and play a game to match the rocks with the correct written description.

WINDOW INTO THE PAST

Focus To understand the cyclic relationships between earth, water, plants and animals through soil study.

Group Size Entire class

Time Required 30-40 minutes

Materials 3 soil cylinders (*Forestry room*)
Traditional Soil Profile (*as a transparency for the overhead*)
Norm's Pit--tephra pit (*as a transparency or student handout*)
Handout: ***Things To Think About***

Physical Setting Forestry classroom and tephra pit (*fenced pit next to the auditorium*)

Process **Activity 1:**
This part of the lesson is spent in the forestry room using an overhead projector and the soil cylinders. The instructor will direct the students.

1. Using the Traditional Soil Profile as a reference, observe the layer of soil collected from three areas in the soil pit and displayed in the soil cylinders.

2. Observe the layers of soil in the tephra pit (soil cylinder display in the Forestry room).

The information accompanying the overhead would include:

Section A:
UNWEATHERED ROCK: *Original rock* that has been unaltered by the environmental forces of water and wind.
Section B:
IMMATURE SOIL I: *Unweathered rock* and *original rock* in the first stages of breakdown, caused by the action of environmental forces and small organisms. This material will support small amounts of plant life.
Section C:
IMMATURE SOIL II: *Unweathered rock, immature soil I* and *newly formed top soil*. The percolating of water and minerals through these materials continues to deepen the thickness of the layers. The newly formed top soil, which contains clay and organic materials, now supports a greater amount of plant life. Root action, decayed plants, and the increased action of small organisms aids in the continued breakdown and refinement of the soil.

Section D:

MATURE SOIL: *Unweathered rock, immature soil I, Immature soil II, newly formed top soil,* and *a layer of fine particles* separated from the top soil. This layer is predominantly clay. In the deepening top soil, plant life and small animal activity flourish.

Activity 2: NORM'S PIT (tephra pit)

This portion of the class will be held at the "Pit", where students will see how this soil has been created in several stages over the last 13,000 years.

1. Discuss the ***Typical Soil Profile***:

Seasonally, river deposits added new layers of material to the ground over several hundreds of years. These re-occurring events increased the soil depth so gradually that little or no change would have been noticed in a person's life-time. The results of events such as the gravel left by glacial action, and the airfall of pumice from the 1498 A.D. eruption of Mt. St. Helens, dramatically changed the soil profile in a short and noticeable amount of time.

NORM'S PIT

Level 5-A, -B (top/youngest layer) topsoil--if you look carefully you can see the ash from the 1980 Mt. St. Helens eruption

Level 4 sand to small pebble sized (Wn, 500 BP, 1500 A.D.)

Level 3 darker, finer grained material--made up of soil from vegetable decomposition, wind and water deposit

Level 2 mottled white and brown pumice (Yb, 3900 BP); from Mt. St. Helens

Level 1 large gravel at the lowest level of the pit. Stream gravel from glacial action (13,000 BP)

Things To Think About

1. Looking at the location of the tephra pit, where do you think the ancient stream flowed?

2. Which direction did it come from, and where did it go?

3. Why do you think that river valleys (bottom land) are considered good farm land?

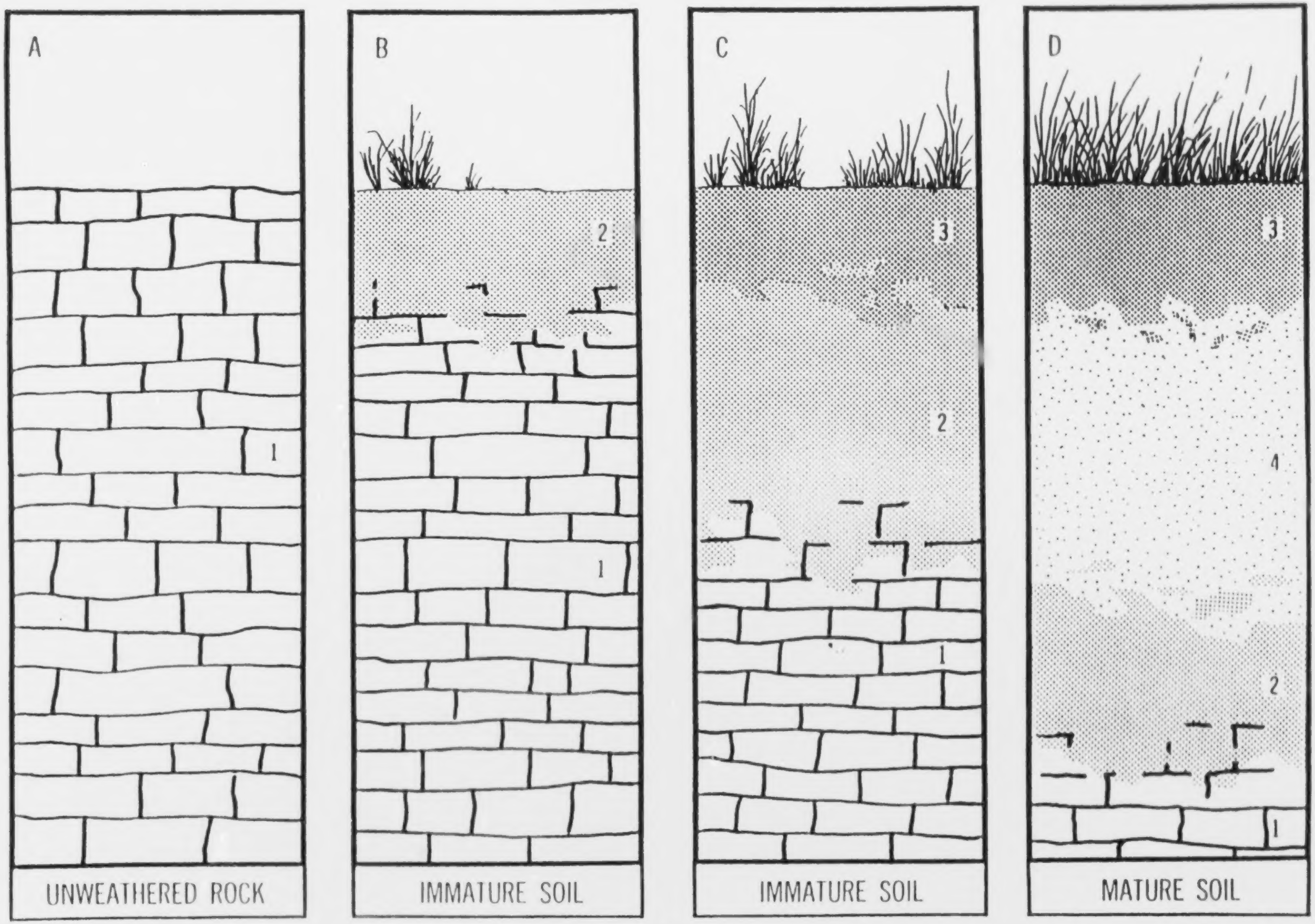
4. Compare the ash layers from the 1980 and 1498 eruptions of Mt. St Helens. Why do you think the 1498 layer is so much thicker?

5. Look at roots running through the various layers of the soil. What actions do you think they produce?

6. Is the soil profile under the Pavilion the same as that of the Tephra Pit? Why, or why not? What is the composition of the soil layers?

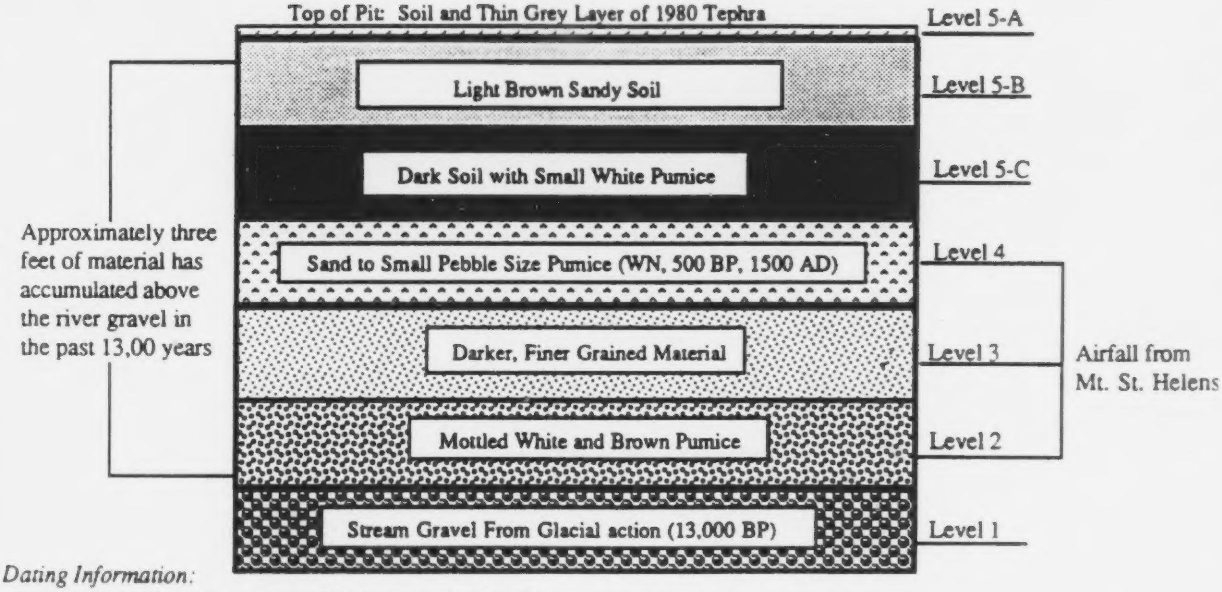
7. Where are other sites at Cispus (such as cut-away banks) where the soil profile can be seen?

Traditional Soil Profile


A
1
UNWEATHERED ROCK
B
2
1
IMMATURE SOIL
C
3
2
1
IMMATURE SOIL
D
3
4
2
1
MATURE SOIL

CISPUS LEARNING CENTER

Norm's Pit


Top of Pit: Soil and Thin Grey Layer of 1980 Tephra
Level 5-A
Light Brown Sandy Soil
Level 5-B
Dark Soil with Small White Pumice
Level 5-C
Approximately three feet of material has accumulated above the river gravel in the past 13,00 years
Sand to Small Pebble Size Pumice (WN, 500 BP, 1500 AD)
Level 4
Darker, Finer Grained Material
Level 3
Airfall from Mt. St. Helens
Mottled White and Brown Pumice
Level 2
Stream Gravel From Glacial action (13,000 BP)
Level 1

Dating Information:
P=Present/1950, when carbon 14 dating was developed
BP= Before Present/1950

The flat surface beyond (east of) the Tephra pit represents a terrace formed by a stream during the last major advance of glaciers into this area, approximately 13,000 years ago. The gravel at the bottom of the pit face, plus the relatively smooth surface that extends along Road 76 from the Yellow Jacket .Creek Bridge supports this conclusion
Other events have affected this surface since then and the layers above the gravel can be uses as clues in determining what happened.

Approximately 3 feet of material has accumulated above the river gravels in the past 13,000 years. The most recent event, the 1980 eruption of Mt. St. Helens, is represented by a very thin, light gray layer of the ash fall (Tephra) material. At the time of the eruption, there was approximately 1 1/2 inches of Tephra on the ground, but the thin gray layer is all that remains as evidence of that catastrophic event.

The most dramatic event represented in this pit is the 3500 year old "Yn" eruption of Mt. St. Helens. Here it is represented by a layer of granular pumice less than a foot thick. In other places not far from here it is nearly 4 feet thick. Tephra from this eruption can be found in northern British Columbia, nearly 600 miles from here.

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North, South, East and West

orienteering and trails

MAPPING MADNESS

Focus To design a trail guide employing collaborative decision making and skill application.

Group Size Entire class

Time Required 1-2 hours

Materials
Wooden popsicle sticks
Lap board (*one per team*)
Pencil

Physical Setting
Standard classsroom (*discussion*)
Braille Trail, Covel Creek Trail (*activity*)

Process 1. Facilitator leads a discussion focusing on the various skills needed to make an accurate map. Points highlighted might include: gauging distances (pacing, highly visible landmarks), producing a map scale, inclusion of a map key for frequently encountered sites, using all the senses (as opposed to sight only), noticeable elevation changes, and colors that would not be subject to seasonal changes.

2. Following the discussion, break the group into small teams of 4-5. Based upon their mapping plan, each team member is given a specific job to do as part of making their map. For example: a team might consist of a recorder who charts the map, a pacer who marks distances, a graphics person who makes margin drawings, and a visual/sensory spotter who captures specific peripheral details for the map.

Large Group Applications:
Divide groups according to the criteria cited above, but disperse them to different starting locations on the trail. Two groups may be given a five minute head-start into a trail, and begin writing their map from a location more central to the trail.

Extension Activities:

Popsicle Sticks

1. Participants are issued five sticks per team (sticks are numbered 1-5). When teams encounter a prominent location they note it on their map. Then hide a numbered stick in an inconspicuous spot in the immediate location and note the location on their map.

2. When teams return to the starting point, they exchange maps and set off to find the sticks, as indicated on the maps. Decide upon a prize and basis for awarding prizes to the teams (most found, how quickly, etc.).

3. Sticks not discovered should be retrieved by the team who planted them. In the unlikely event that a stick is not retrieved, it will eventually decompose.

Poetry

1. Using the completed map as their guide, group members design a memory poem to implant useful landmarks, smells or sounds.

2. The groups then recite their poem to other groups, who try to use the poem as a guide for a successful tour of the trail.

Compasses

1. Map the key highlights of the trail using compass headings as the direction indicators. Participants can measure distances to be traversed using pacing or clock time.

WHERE AM I?

Focus To learn the parts of a compass, how to find a given direction, pacing, and following a compass course (*instructors must be fluent with a compass*).

Group Size Entire class

Time Required 2 hours

Materials A compass for each student and instructor
Pre-made compass courses on 5x7 cards

Physical Setting Field or forest

Process

Activity 1: PARTS OF THE COMPASS

Divide into groups of six, with one instructor/counselor for each group. Then, begin to describe each of the parts of the compass, checking to see that everyone is using it correctly. The parts described should include: base plate, 360 degree dial/bezel, index line, direction of travel arrow, alignment arrow, and magnetic needle. After describing all of the parts, review by asking the students to name and describe the uses of the parts.

Activity 2: FINDING A GIVEN DIRECTION

Explain to the students that to find a "given direction" they must align the direction they want to go with the index line, then align the magnetic arrow with the alignment arrow. Now the direction of the travel arrow is pointing in the direction they want to go. Ask the students to find a specific heading (North), and name an object in line with that heading. Check to make sure all the students have it correct, then ask them to find a more difficult bearing (275 degrees).

Activity 3: PACING

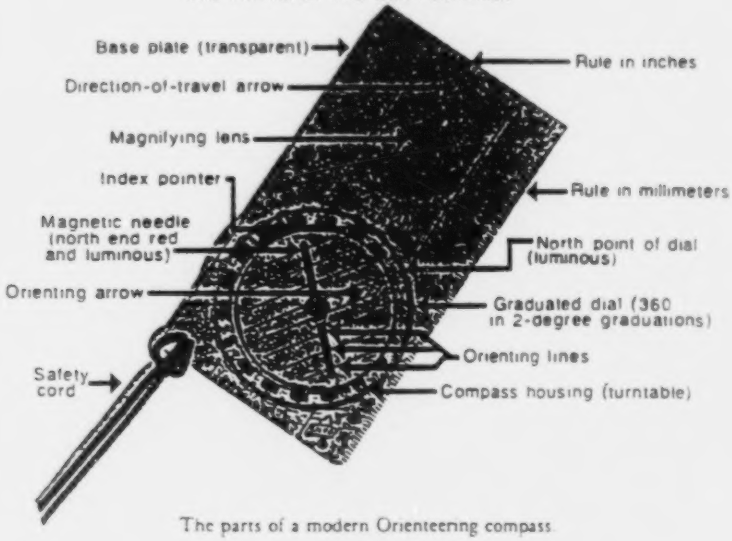
The next step is pacing. Mark-off a 5 meter area and have the students walk between the two points, counting their steps. Now they will be able to figure out distances by pacing. Ask them how many paces they would take to go 20 meters, or 35 meters, etc. (Divide the number of meters by 5, then multiply that number by the amount of paces in 5 meters.)

Activity 4: COMPASS COURSES

The next exercise is to have the students do a small course. This course should be written on 5x7 cards and consist of three different directions--equal distances, forming an equilateral triangle. Have the students place something on the ground where they start from and then see where they end up. After completing the triangle correctly, give them another 5x7 card with a more complex course on it. Markers can be used to keep each leg of the course fairly accurate. There is a wide variety of difficulties you can achieve by making different courses, so use your imagination!

NOTE:
This orienteering exercise does not include declination or map use. These subjects could be covered in a following exercise.

THE PARTS OF THE SILVA COMPASS


Base plate (transparent)
Direction-of-travel arrow
Magnifying lens
Index pointer
Magnetic needle (north end red and luminous)
Orienting arrow
Safety cord
Rule in inches
Rule in millimeters
North point of dial (luminous)
Graduated dial (360 in 2-degree graduations)
Orienting lines
Compass housing (turntable)

The parts of a modern Orienteering compass.

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LOOKIN' SOUTH

Focus To illustrate use of the sun's position in determining direction. (*Basic knowledge of compass use necessary; refer to* ***WHERE AM I?***)

Group Size Entire class, divided into groups of 6

Time Required 40 minutes, divided into 4 - 10 minute segments approximately 2 hours apart (*i.e. 9:30am, 11:30am, 1:30pm, 3:30pm*)

Materials
One compass for each group
Field journal
Pen/pencil

Physical Setting Any outdoor setting in the sunlight

Process

Activity 1: TAKING BEARINGS

1. Team members select their jobs: each team needs 1 sighter/reader, 1 recorder, and 4 shadow line members.

2. In direct sunshine, have shadow-line members of team line up on each other's shadows, about 4 feet apart.

3. Sighter/reader stands about 10 feet from shadow-line members in line with the shadow.

4. Sighter/reader then lines up compass north to magnetic north as indicated by compass needle.

5. Sighter/reader then sights down the shadow-line and reads out the bearing (in degrees) to the shadow-line.

6. The recorder then notes the time and relative bearing.

7. All members write down these notations in their field journal.

ACTIVITY 1 IS THEN REPEATED 2 TO 3 MORE TIMES AT APPROXIMATELY 2 HOUR INTERVALS.

Activity 2: FINDING YOUR DIRECTION

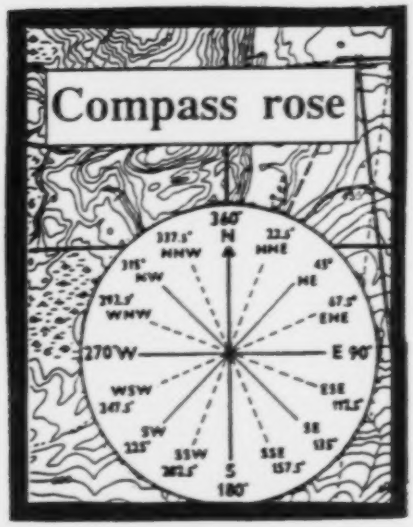
1. Subtract 21 & 1/2 degrees from each of your relative bearing readings and note these new (true) bearings on a compass rose with the time of observation.

Note: Compass readings are based on magnetic north and 21 & 1/2 degree east of true north.A correction must be made for the difference between *true* and *magnetic* north.

2. Answer the following questions:
a) What so you estimate the position of the sun was at noon?
b) Before noon, was the position of the sun closer to the Southeast or Southwest?
c) If you face the sun at Noon, in which direction will your shadow point?

EXTENSION OF LESSON:

An ordinary analog wrist or pocket watch can help find true north. In the North Temperate Zone (from latitude 23 & 1/2 to 66 & 1/2 degrees) point the hour hand toward the sun. A line halfway between the hour hand and 12 o'clock (standard time) or halfway between hour hand and one o'clock (daylight time) is a north-south line. On cloudy days, hold a small stick at the center of the watch so its shadow falls along the hour hand. A line halfway between the shadow and 12 o'clock (standard time) points north.



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Take A Dip

water and wetlands

BENDS BOULDERS, SWIRLS, AND EDDIES

Focus To use field investigations and problem solving skills in determining the importance of streams to the plants and animals which live around it.

Group Size Entire class

Time Required 1 hour

Materials *Per group:*

6" stick
Yard stick
Clipboard
Wet gear (*boots*)
50' measuring tape
Watch with sweep hand
Pencils
Handout: ***A Determination of Streamflow***

Physical Setting Covel Creek

Process 1. Begin this activity by discussing with the class the importance of water, and its many uses. Water in streams such as Covel Creek provide a valuable resource to people who live near it. It is also important for the plants and animals which live in this area. Covel Creek is home to many aquatic creatures and plants. Have the students discuss this aspect and come up with guidelines that will enable them to take their measurements, while doing the least damage to this aquatic habitat.

2. Each group will select a member to be the official group recorder. This person will be responsible for writing down the information that their group collects.

3. Follow the Covel Creek Trail until you reach Covel Creek. Once there, each small group will select a fairly straight area of the creek to take their data from. Using the handout, take the required field measurements. Return to camp and complete the final calculations.

4. Follow-up the activity by completing the discussion questions, discussing the results from each group's calculations (using a chart of class results), drawing some conclusions on the impact of Covel Creek on the ecology of the area, and on man's impact on the ecology through water use.

A Determination Of Streamflow

Water is needed for many purposes. Streams such as this one can provide a valuable resource to people who live near it. It is also important for the plants and animals which live in this area.

A. Using a tape measure, mark off a 50 ft. distance along your chosen section of Covel Creek. Then, have two students stand in the stream, one at each end of the 50 ft. distance. These two are your markers. Find out how fast the creek is flowing. Using the 6" stick, have a member of your team set the stick in the water, upstream from your first marker. Release the stick and time the number of seconds it takes the stick to float between the two markers. Repeat the procedure two more times. Record the times below and average them.

First measurement__________________ seconds

Second measurement__________________ seconds

Third measurement__________________ seconds

Total____________ ÷ 3 = __________ average seconds

B. To find out the feet per second the stick made, divide the 50 ft. distance by the average seconds it took the stick to float between the markers

50 ft. ÷ average seconds = ____________ ft. per second

C. Find the average width of your section of the creek. Measure the width of the stream at 3 places within the 50 ft. area. Record the measurements below and average them.

First measurement__________________ft.

Second measurement__________________ft.

Third measurement__________________ft.

Total__________ ÷ 3 = __________ ft.
(average width)

D. Find the average depth of your section of the stream. Wade across the stream in a straight line. Measure the depth of the stream in 3 places (near bank, middle, far bank) to get the average depth of the stream.

First measurement ____________________ **ft.**

Second measurement ____________________ **ft.**

Third measurement ____________________ **ft.**

Total __________ ÷ 3 = ______________ **ft.**
(average depth)

E. Find the cubic feet of water per second. Multiply the average depth, average width, and the number of feet the stick floated each second. This will tell you the number of cubic feet of water flowing in the stream every second.

____________ X ____________ X ____________ = ____________
(average width) (average depth) (No. of ft. per sec) (cubic ft. of water flowing per sec)

Note: *A cubic foot of water is the amount that will fill a container 1 ft. wide x 1 ft. high x 1 ft. long, or 7.48 gallons.*

Use this table of water measurements to answer the questions below

A waterflow of 1 cubic ft. per second = 449 gallons per minute

One cubic foot of water = 7.48 gallons

One cubic foot of water = 62.5 pounds

F. How many gallons of water flow in this stream every second?

____________ X ____________ = ____________
(stream flow in cu. ft./sec) (gallons/cu. ft. of water) (gallons of water/sec)

G. How many gallons of water flow in this stream every minute?

____________ X 60 = ____________
(gallons water/sec) (seconds/minute) (gallons of water/minute)

H. Each person uses about 150 gallons of water a day. What is the total number of people who could live from the water in this stream?

____________	X	____________	=	____________	+	____________	=
(gal water/min)		(No. of min/day)		(total gal of water/day)		(amt. water 1 person uses/day)	

____

(total No. of people who could live from the water in this stream)

Discussion:

1. How many people in your community could live off of the water in this stream?

2. What would happen to this environment if we piped all the water out of the stream at this point and into your community?

3. If we were going to use this water, how much water should be left to flow down stream?

4. Does this stream always have the same amount of water in it? Why?

5. What are some problems you have encountered during this task?

ROCKS + WATER

Focus	To understand the forces that created and shaped the Cispus area using lecture, guided inquiry, reading and field study.
Group Size	12 students
Time Required	1.5 hours
Materials	Writing tools 3 or 4 copies of the USGS Tower Rock, Washington, quadrangle maps (*available at Cispus*) Handout: ***ROCKS + WATER Questions***
Physical Setting	Cispus Road *(adjacent to the local Volunteer Fire Station)* Cispus Center service roads and trails Gravel bars at the edge of Yellowjacket Creek and the Cispus River
Process	1. Walk your group to the main entrance of the center. Review with them safe walking rules for country roads. Turn right and walk, on the left side of the road facing on-coming traffic, about .25 miles to the parking lot of the volunteer fire station. At this point you have a great view of Tower Rock. 2. Have the students answer the first few questions. Pass out the maps and help the students get oriented. By examining the map they should be able to answer the next few questions. (Tower Rock is 3335 ft. high, the vertical face is about 550 ft. and it is 2000 ft. from the valley floor to the top of the rock). After the "Talus slope" question, return to the Cispus Center. 3. Take the group out to a gravel bar on the Cispus River, it will give them a good vantage point to complete the rest of the questions (the questions can be completed back at the center if you are running out of time).

ROCKS + WATER Questions

The geology and geography of the area around Cispus is as interesting as any in Washington State. We are just south of an old volcano and the largest mountain in the Cascade Range--Mt. Rainier. There are two other volcanoes sitting atop the Cascade Range even closer to Cispus. **NAME** these other two volcanoes:

Mt.______________________________, and Mt.______________________________

A material known as pumice can be found all over the area from past eruptions of mostly Mt._______________________, whose last eruption was in (date) ____________________.

WHAT is the test you can run to see if it really is pumice?

HOW do you suppose pumice was formed?

HOW did it get here?

Very visible throughout much of this valley is Tower Rock. **LOOKING** at the USGS Tower Rock quadrangle map, find the Cispus Center. Nearby is Tower Rock. At its peak, **WHAT** is the elevation of Tower Rock? (The contour interval between the brown contour lines on the map is 40 ft. That means that the contour line on either side of a single line shows a spot 40 ft. higher or lower. If these lines are spaced wide, an inch or so, apart then the land is fairly flat.)

___________________________ft.

Tower Rock is a lacolith--an intrusion of molten rock under the surface of the earth. With the advance of the Ice Age large glaciers lifted many valleys and abraded away the face of the mountain, leaving a new vertical cliff. **DRAW** in the space below what you think this creation process looks like:

IF the contour lines are placed close together then the slope is ____________________. Compare these kinds of areas on the map.

IF the contour lines are spaced so close together that they seem to merge, you have a __________________. The vertical face of Tower Rock measures about ____________ feet, and is about ___________ feet from the valley floor to the top of Tower Rock.

At the base of the vertical face of Tower Rock is a slope of loose boulders. This is called a *talus slope*. **HOW** do you suppose it got there?

WHAT is this weathering process called?

The Cispus River Valley was formed by two entirely different forces of nature (both involve water). **NAME** these two forces: ______________________, and ______________________

These forces create two distinct types of valley formations:
V-shaped valleys are formed by ________________.
U-shaped valleys are formed by ________________.

The forces of nature have altered the landscape in many ways in this region. **NAME** at least 3 ways in which this might happen: _______________, ______________, and ______________.

WHAT evidence do you see of past flooding in the area between the upper Cispus Center buildings and the Cispus River?

DRAW A PROFILE from the Cispus Center flagpole to the Cispus River:
Flagpole **X**

X
Cispus River

WHAT natural force is still at work in this beautiful river valley?

WATER INGREDIENTS

Focus	To develop some skills in collecting and interpreting data about the water environment and applying that data in discussion. *Adapted from the Investigating Your Environment Series, U.S. Forest Service.*
Group Size	Maximum 30
Time Required	1-5 hours
Materials	Writing instruments Blank sheets of paper (*recording answers & observations*) Clipboard (*writing surface*) Handouts: ***Describing a Watershed*** ***Observing the Water Environment*** ***Observing and Collecting Aquatic Life*** ***Predicting Water Characteristics*** ***Testing Your Predictions*** ***Determining Water Amounts (streamflow, lake & pond volume)*** ***Discussion Questions***
Physical Setting	Yellowjacket Ponds and Yellowjacket Creek
Process	1. Follow the instructions on the ***WATER INGREDIENTS*** handouts. Additional materials for each exercise are listed on the individual handouts--they all require the materials listed on this page. If your time is limited you may want to select only a few of the exercises to complete. 2. Answer the discussion questions for ***WATER INGREDIENTS*** that pertain to each exercise you choose.

Observing the Water Environment

Materials: Handout: ***Discussion Questions***

As you approach the water, record your observations (10-15 minutes).

Plants:

Animals:

Air:

Rocks:

Water:

Discussion Questions

Describing a Watershed

1. What activities could change the characteristics of the water?

2. What would be some reasons for having people look at watershed boundaries on a map before investigating a stream in that watershed?

Observing the Water Environment

1. What did you notice about the stream or pond environment?

2. What plants were growing along the gravel bar or banks?

3. Why are/are not large trees growing on the gravel bar or banks?

4. What did you notice about the rocks?

5. Where did you see the bigger rocks, and where did you see the smaller ones? Why do think they were there?

Observing and Collecting Aquatic Life

1. What animals did you find? Compile a class list (preferably on a chart), recording the information collected by each student or group of students.

2. Where did you find most of the specimens?

3. What similarities are there among the specimens?

4. What differences did you find?

5. What classification system could you use to classify the aquatic animals you found?

6. What other life would you expect to find in this stream?

7. Would you be likely to find the same specimens in a different aquatic environment? Why or why not?

Predicting Water Characteristics
based on aquatic life

1. As a group, discuss the range of predictions.
2. What criteria did you use to arrive at your predictions?
3. How can you test out our predictions?

Testing Your Predictions

1. How did the test results compare with your predictions?
2. What might account for any differences in the results from each group?
3. Under what conditions might you expect to get different results than you did today?
4. What can you say about the quality of the water in this pond/stream so far?
5. What would you need to know to decide whether or not this water is potable?

Determining Water Amounts

1. What results did you get? Compare group results.
2. How did your prediction compare with your calculations?
3. What would happen to this environment if we piped all the water at this location into a community?
4. If you were going to use some of this water, how would you determine the amount to be left to maintain the environment?
5. What things might affect the amount of water needed to maintain the environment?
6. What else would you need to do, if you wanted a more accurate result, to determine the adequacy for a community water supply?

Summary Questions

1. What did you find out about water from our investigations today?
2. Why is water important to the ecosystem?
3. How can you summarize our discussions and investigations?
4. What methods and processes did we use in our investigations today?

5. Describe in writing how you feel about man's effect on the aquatic environment at this site.

6. Describe at least one action you can take in your everyday life to help improve the way water is managed.

in your home: ______________________________

in your community: ______________________________

in your consumer habits: ______________________________

7. Describe the benefits of each action in question 6.

Observing and Collecting Aquatic Life

Materials: Collecting equipment (*screens, jelly cups, nets, etc.*)
White dishpans
Glass observation jars
Identification book(*lets*) for aquatic organisms
Handout: ***Some Sub-surface Freshwater Organisms &***
Some Aquatic Insects *I.D. sheet*
Discussion Questions

1. As a class, or in smaller groups, discuss these questions before you begin collecting specimens. Write down the answers to compare with your actual findings.

What kind of life would you expect to find in this water?

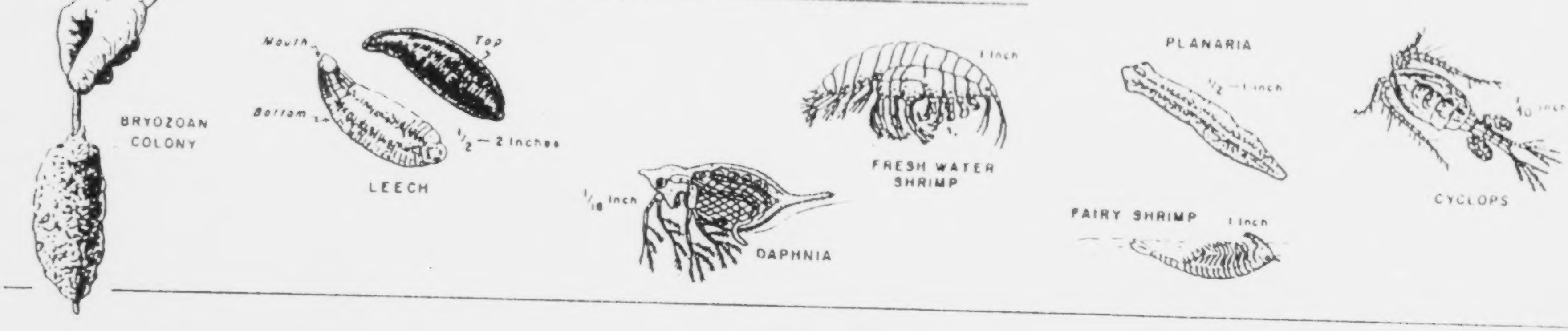
Where would you expect to find animals in this water environment?

What are some guidelines that you need to consider in collecting aquatic life to cause the least impact on the environment? (consider: keeping animals for observation, overturned rocks, what to do with specimens after the exercise, vegetation, etc.)

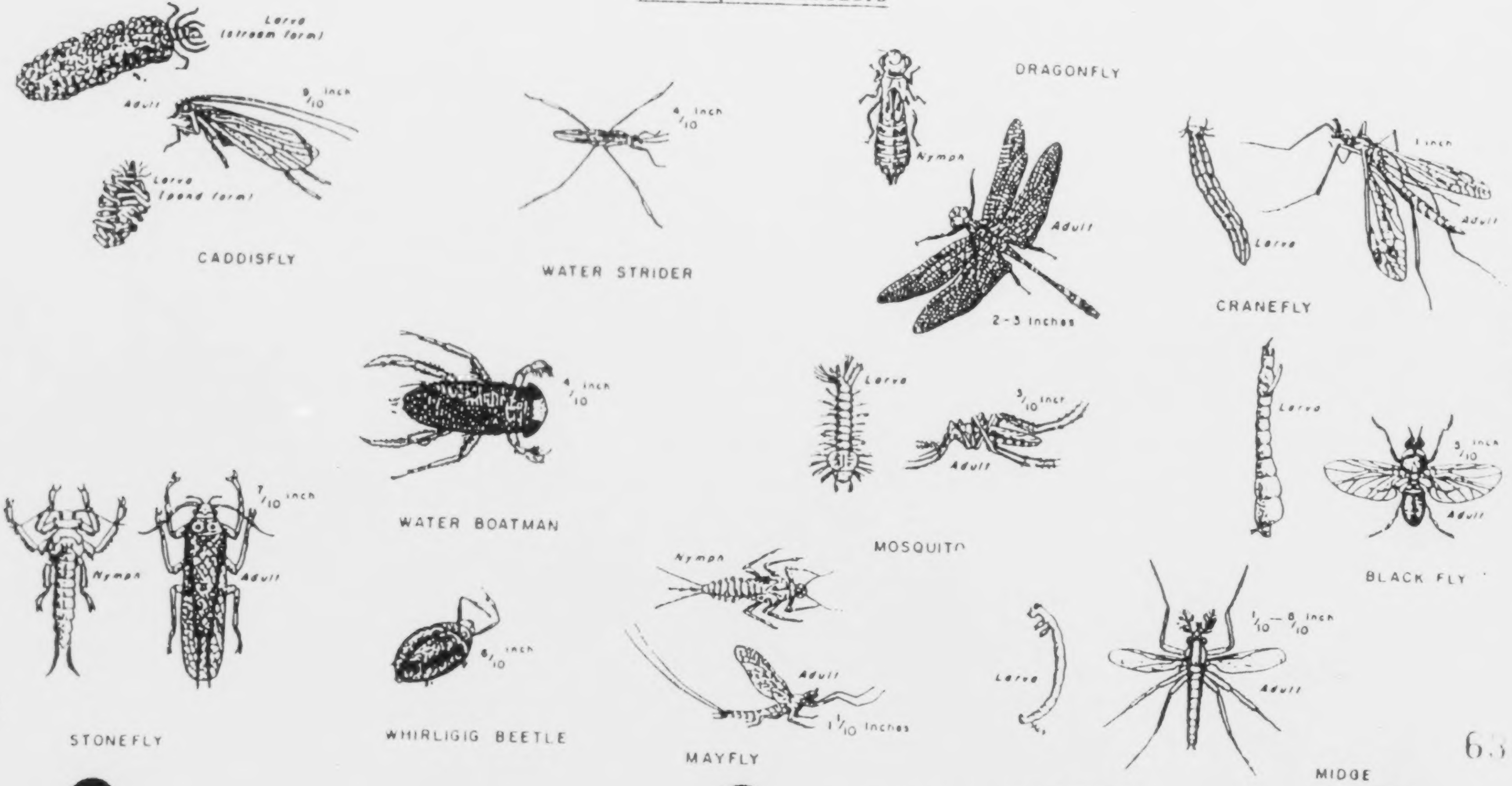
2. Using collecting equipment, collect as many kinds of aquatic animals as possible with minimal disturbance to the aquatic habitat. Place the organisms into the white dishpans and glass jars for observation (keep in a cool place). Using the identification guides, spend the next 20-30 minutes identifying what you have found. List or sketch your findings below:

Where was it found?	**Name or Sketch**	**No. Found**

SOME SUB-SURFACE FRESH WATER ORGANISMS


BRYOZOAN COLONY
Mouth
Top
Bottom
1/2 — 2 Inches
LEECH
1/16 Inch
DAPHNIA
1 Inch
FRESH WATER SHRIMP
PLANARIA
1/2 — 1 Inch
FAIRY SHRIMP
1 Inch
1/10 Inch
CYCLOPS

SOME AQUATIC INSECTS


Larva (stream form)
Adult
9/10 inch
Larva (pond form)
CADDISFLY
4/10 inch
WATER STRIDER
DRAGONFLY
Nymph
Adult
2-3 Inches
1 Inch
Larva
Adult
CRANEFLY
4/10 inch
WATER BOATMAN
Larva
3/10 inch
Adult
MOSQUITO
Larva
3/10 inch
Adult
BLACK FLY
7/10 inch
Nymph
Adult
STONEFLY
6/10 inch
WHIRLIGIG BEETLE
Nymph
Adult
1 1/10 Inches
MAYFLY
Larva
1/10 — 8/10 inch
Adult
MIDGE

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Predicting Water Characteristics
based on aquatic life

Materials: Results from ***Observing and Collecting Aquatic Life***
Handout: ***Discussion Questions***

1. Based on the aquatic organisms you found, and the charts below in Analyzing Data, predict the following characteristics of this creek/pond:

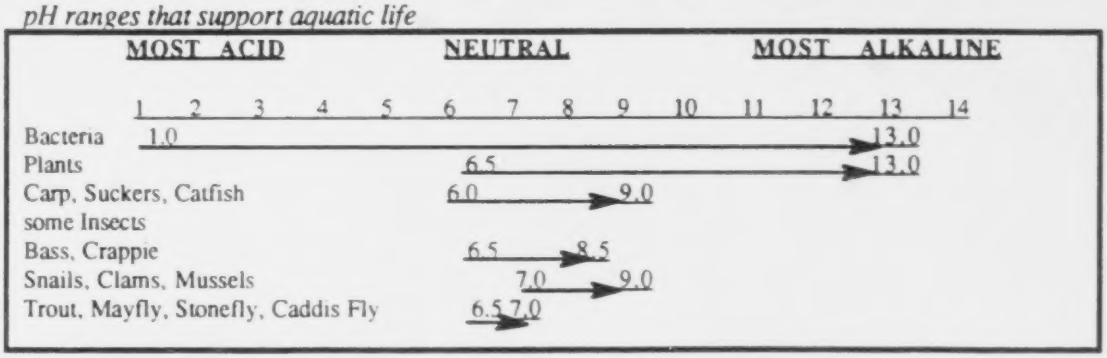
The water temperature will be _________, because _________________________________
The air temperature will be _________, because _________________________________
The pH will be _________, because _________________________________
The dissolved O_2 count will be _______, because _________________________________
I can see about ______________ feet down into the water.
The color of the water is ____

ANALYZING DATA:

Approximate temperature ranges required for certain organisms

Temperature (Fahrenheit)	Examples of Life
Greater than 68 degrees (high range)	much plant life, many fish diseases most bass, crappie, bluegill, carp, catfish, caddis fly
55-68 degrees (middle range)	some plant life, some fish diseases; salmon, trout, stone fly, mayfly, caddis fly, water beetle
less than 55 degrees (low range)	trout, caddis fly, stone fly, mayfly

pH ranges that support aquatic life



dissolved oxygen requirements for native fish and other aquatic life

Examples of Life	D.O. in parts/million or milligrams/liter
Cold-water organisms, including salmon and trout (below 68 degrees F); spawning, growth and well-being (caddisfly, stone fly, mayfly)..	6 p/m and above
Warm-water organisms, including game fish : bass, crappie catfish and some carp (above 68 degrees F). Growth and well-being (some caddisfly)..	5 p/m and above 45

Testing Your Predictions

Materials: Hach O_2 pH Testing Kit (*or equivalent*)
Secchi disk
Results from ***Predicting Water Characteristics***
Handouts: Table A
Table B
Table C
Discussion Questions

1. We can test out the predictions we just made, using O_2 pH testing kits. Instructions are inside the lid. Work in groups of 5-6. Each group will have one kit to use. There are a lot of jobs to be done in testing (clipping, squirting, swirling, dipping, counting, reading, etc.), so make sure that everyone in the group has a job to do.

2. Using the water test kit, determine the water and air temperature, dissolved oxygen count, and pH of the stream or pond. Record data below.

Name of stream or pond:

Location of water sample (edge, middle, bottom, bank, etc)	Time Taken	Temperature water/air water/air		pH		Useable Oxygen (ppm) (mg/liter)	
		my pred.	actual test	my pred.	actual test	my pred.	actual test

3. Refer to your data from ***Predicting Water Characteristics*** and Table a. Based on this information, what can you say about this water (water productivity and color)?

4. Transparency of lake and pond waters can be roughly determined by the use of a Secchi disk (a plate 8" in diameter, painted white and black in alternate quadrants), which is lowered on a line into the water until it can no longer be seen. Very little sunlight penetrates below the point at which the disk disappears. Lower the Secchi disk into the water until it can no longer be seen. Measure depth from the surface of the water to the disk: __________ft. Compare this measurement to your prediction: _______ft. Based on the depth of the Secchi disk and Table b, what can you say about the water?

6. Based on the temperatures you recorded for your pond, the season of year and the information in Table c, describe what you think is happening in the water now:

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Table [illegible] elationships of water color to productivity:

The qu[illegible]ity of life that may be present in any given body of water at any given time is often referred to as the "productivity." A water of low productivity is a poor water, biologically speaking, but is a clean water and desirable as a water supply or for recreational use. A productive water may be either a nuisance to man or it may be highly desirable. Foul odors and weed-choked waterways are usually branded a nuisance; however, bumper crops of bass, catfish or sunfish may be the result and are highly desirable.

Color of Water	Probable Cause	Fish Food Productivity
Clear	Absence of algae and microorganisms	Low
Greenish hue	Blue-green algae	Moderate
Yellow to yellow brown	Diatoms (microscopic, one-celled algae)	Moderately high
Red	Micro-crustaceans	High
Dark Brown	Peat, Humus	Low
GEOLOGICAL FACTORS HAVING BEARING ON COLOR		
In limestone geology-Green	Abundant calcium	Moderate
In volcanic geology-Yellow-green, Red	Abundant sulfur Abundant iron	Low Moderate

Table b Relationship of Water Clarity to Fish Food Production and Watershed Condition

Depth you can see into water (Secchi disk reading)	Interpretations of Depth Readings		
	Fish Food Production (If reasons for degree of clarity are biological-(algae, etc.)	Condition of Watershed above Water Readings (If reasons for degree of clarity are physical-soil siltation, etc.)	Possibility of Dissolved Minerals
0 - 6	Most productive waters for fish food Maximum oxygen from photosynthesis (greatest diurnal variation) Maximum algae growth	Poor condition due to soil runoff, slides, etc	Most
↓	↓	↓	↓
- 24	Least productive for fish food Minimum oxygen from photosynthesis (least diurnal variation) Minimum algae growth	May indicate better condition because of vegetation cover - more stable soil, etc	Least

Table c: Temperature Layering in Ponds - Lakes

In summer, the surface water absorbs the sun's heat and warms faster than the water below. The warmed water is lighter than the cold water, so it floats on the cool layers. By midsummer there are three distinct layers.

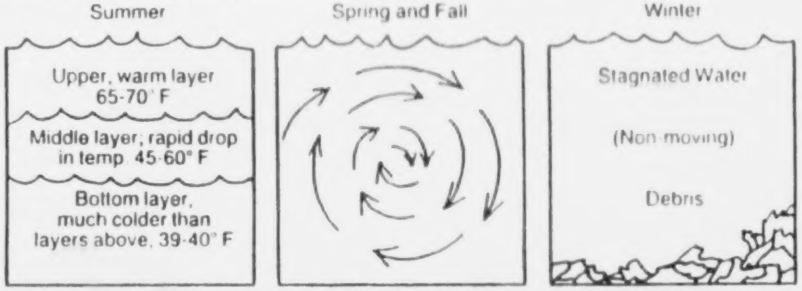
During the summer, mixing or circulation is prevented by these stratified layers of water which act as a barrier.

The upper layer of water cools in autumn until it approaches the temperature of the water in the middle and lower layers. Aided by winds, the surface water sinks causing circulation from top to bottom.

In winter, the cold surface water continues to sink and the water becomes stagnated, photosynthesis slows, and oxygen levels drop.

In the spring, aided by winds, another circulation and mixing occurs, called the "Spring Overturn."

1. Seasonal Change Diagram

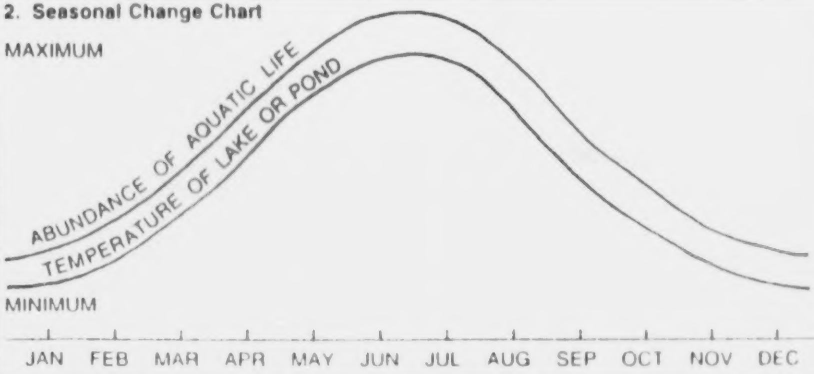

Summer
Upper, warm layer 65-70° F
Middle layer; rapid drop in temp. 45-60° F
Bottom layer, much colder than layers above, 39-40° F
Spring and Fall
Winter
Stagnated Water
(Non-moving)
Debris

During the summer, fish and aquatic life are most active.

During spring and fall overturns the temperature of the water is equalized throughout the lake. Fishes and other animals are more active than in winter but less active than in summer.

Activity is greatly reduced during the winter. Many animals hibernate in the mud or debris at the bottom.

2. Seasonal Change Chart



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Determining Water Amounts

Streamflow

Materials: Measuring tape
2 stakes (*distance markers*)
5-6" stick
Handout: ***Discussion Questions***

Before beginning this exercise, discuss these questions as a class or in groups:

How many people do you think could live off the water in this stream (domestic water use only)?

What measurements do we need to know in order to determine the amount of water in this stream? Discuss how you would make the different measurements.

1. Measure and mark a 100' distance along a straight section of your stream. If you can't find a 100' section, use 25' or 50' (and multiply the results by 4 or 2). Throw your stick in the water above the upstream marker. Record below the number of seconds it takes to float downstream between the markers. Now divide the 100' distance by the total seconds it took the stick to float between the stakes. Repeat the stick exercise three times and use the average time.

First measurement **100 ft ÷ (total seconds to float 100 ft)** = ____________ **ft/second** (# of feet stick floated each second)

Second measurement **100 ft ÷ (total seconds to float 100 ft)** = ____________ **ft/second** (# of feet stick floated each second)

Third measurement **100 ft ÷ (total seconds to float 100 ft)** = ____________ **ft/second** (# of feet stick floated each second)

Total (ft/second) ÷ 3 = ____________ **ft/second average**

2. Find the average width of your section of the stream. Measure the width of the stream at 3 places within the 100' area. Divide the total by 3 to get the average width of the stream.

First measurement______________ **ft**

Second measurement______________ **ft**

Third measurement______________ **ft**

Total______________ ft. ÷ 3 = ______________ ft (average width)

3. Find the average depth of your section of the stream. Measure the depth of the stream in 3 places, going across in a straight line (near bank, middle, far bank). Divide the total by 4 to get the average depth of the stream (the reason you take 3 depth measurements then divide by 4, is to take into account the shallow areas of the stream).

First measurement ______________ ft

Second measurement ______________ ft

Third measurement ______________ ft

Total $\frac{\text{\_\_\_\_\_\_\_\_\_\_\_\_}}{4}$ ft = ____________ ft (average depth)

4. Find the cubic feet of water (enough water to fill a container 1' x 1' x 1', or 7.48 gallons) per second. Multiply the average width, average depth, and the number of feet the stick floated each second.

____________ ft X ____________ ft X ____________ = ________________
(Average width) (Average depth) (# of ft/second) (Cubic ft water/second)

5. In order to find out how many people could live from the water in this stream, complete the following calculations.

(A) ____________________ X ___7.48___ = ____________________
(Stream flow in cu. ft/sec) (Gallons in 1 cu. ft of water) (Gallons of water/second)

(B) ____________________ X ___60___ = ____________________
(Gallons of water/second) (seconds in a minute) (Gallons of water/minute)

(C) ____________________ X ______________ = ______________
(Gallons of water/minute) (# minutes in a day) (Total gallons of water/day)

(D) $\frac{\text{(Total gallons of water/day)}}{\text{*200 gallons}}$ = __________________________
(Total # of people who could live from water in this stream)

**The average person uses about 200 gallons of water a day for home use. This does not reflect each person's share of water used for industrial, public services, and commercial. (U.S. Office of Education figures.)*

Determining Water Amounts
Volume of Lake or Pond

Materials: Measuring tape
Handout: ***Discussion Questions***

Before beginning this exercise, discuss these questions as a class or in groups:

How many people do you think could live off the water in this pond (domestic water use only)?

What measurements do we need to know in order to determine the amount of water in this pond? Discuss how you would make the different measurements.

1. Find the average diameter of the pond by measuring the length and width. You may have to take several length and width measurements and average them.

Pond width______________ **ft**

Pond length______________ **ft**

Total______________ **ft** ÷ **2** = ______________ **ft.**
__________ (average diameter)

__________**ft** ÷ **2** = __________**ft**
(average diameter) (radius)

__________ **ft** **X** __________**ft** **X** **3.14** = __________ **sq. ft.**
(radius) (radius) (surface area)

2. Find the average depth of the pond or lake. Measure the depth in 3 places in a line (transect) across the body of water, as near the middle as possible. Add these depths and divide by 4 to get the average depth. The reason you take 3 depth measurements then divide by 4 is to take into account the shallow areas of the pond. If additional accuracy is desired, repeat this process along additional transects and average the results.

First measurement____________________ **ft**

Second measurement____________________ **ft**

Third measurement____________________ **ft**

Total____________________ **ft** ÷ **4** = ____________________ **ft**
(average depth)

3. Compute the number of gallons of water in the pond or lake.

Method I

(A) ____________sq ft X ____________ft = ______________cu. ft.
(surface area of pond/lake) (average depth) (volume in cubic feet)

(B) ______________ cu. ft. X *7.48 = _______________ gallons
(volume in cubic feet) (gallons of water)

Method II

(A) ______________sq ft X ______________ft = ______________cu. ft.
(surface area of pond/lake) (average depth) (volume in cubic feet)

(B) **(volume)** cu.ft. ÷ **43,560 sq.ft. = _______________ acre-feet of water**
in an acre

(C) _______________ X $\frac{\text{395, 900}}{\text{(gal/acre-feet)}}$ = _______________
(acre-feet) (gallons of pond water)

5. In order to find out how many people could get their domestic needs for one day from the water in the pond, complete the following calculations:

$\frac{\text{(gallons of water in the lake/pond)}}{\text{**200}}$ = ________________________
(total # of people who could live one day from this water)

**A cubic foot of water is the water that can be held in a 1' x 1' x 1' container--or 7.48 gallons.*

***The average person uses about 200 gallons of water a day for home use. This does not reflect each person's share of water used for industrial, public, and commercial services. (U.S. Office of Education figures.)*

Describing a Watershed

Materials: Topographic maps (*of Yellowjacket Ponds/Yellowjacket Creek area*)
Aerial photos (*optional*)
Handout: ***What is a Watershed?***

1. Describe what you think a watershed is:

2. In small groups of 5-6, use the maps and photos to determine the location where we will be collecting our water information. Find your location on the creek/pond/lake on the map. Where does the water come from (trace upstream to its source)? Where does it go?

3. Draw a line around the watershed boundaries. We're in the ____________________________ creek/lake/pond watershed.

4. What activities in this watershed might change the characteristics of this water?

Activity	Ways the activity might change the characteristics of the water

What is a watershed?

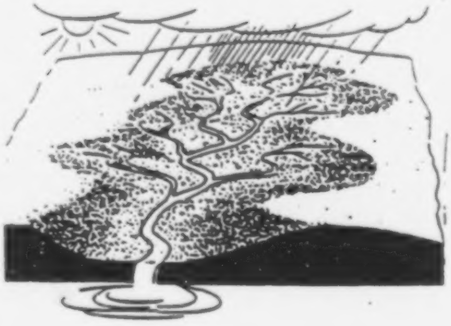


Diagram of a watershed showing the drainage pattern.

"Watershed" is a new term to many people. The increasing use of soil and water conservation measures for watershed protection and flood prevention is bringing the term into more common use. Its definition is almost as simple as the well-known phrase "water runs downhill." The drainboard that carries rinse water into your kitchen sink can be compared to a watershed. On land, water that does not evaporate or soak into the soil usually drains into ditches, streams, marshes, or lakes. The land area from which the water drains down to a given point is a watershed. When you were a small child, you probably had a favorite mud puddle in which you liked to play. The part of the yard from which the water drained into the puddle was its watershed. Possibly a small stream ran by your house. It may have been dry most of the year, or it may have flowed continuously. Water from a few acres drained into that little stream. Those few acres were its watershed. That small stream and others like it ran into a larger one. The land areas drained by the small streams made up the watershed of the larger stream into which they flowed. Small watersheds make up the larger ones. The Mississippi River, for example, drains a watershed of about 1,243,000 square miles.

Vocabulary:
Can you define these terms?

Precipitation:

Runoff:

Streamflow:

Wetland:

Watershed boundaries:

Potable:

Coliform:

WETSIDE STORY

Focus To understand human impacts on an ecosystem that is dominated by animals and plants. To relate and see issues from another point of view, by playing a character.

Group Size 5 primary characters, up to 20 additional character "extras"

Time Required 30 minutes (*plus time to construct puppets/costumes, stage, and practice*)

Materials

Script
Six-pack ring (*Dudley*)
Scarf and hat (*Gilbert*)
Paper bags (*puppets, costumes*)
Fish (*Harry*)
Buck teeth (*Bucky*)

Physical Setting Indoors (*with the primary characters in front of the group*), or outdoors in good weather.

Process *The script can be followed as a role play, or hand puppets can be made from bags and materials. Besides the five primary characters (Patty the Presenter, Harry the Heron, Dudley the Duck, Bucky the Beaver, and Gilbert the Goose), students can also be trees, reeds, background animals, and members of the stage crew.*

1. The play begins with an introduction to the wetland by Patty the Presenter about the wetland and her animal friends that live there. This is a story about their struggles with human impacts on their home.

Discussion:

Patty also wraps up with a discussion about the plight of her friends and efforts we can make to have less impact on their homes.

1. After the play or puppet show brainstorm about other animal homes, the ways that human behavior impacts them, and how we can lessen those impacts.

2. Compare human impacts on animal homes to the destruction of student's homes.

3. Discuss lower impact behaviors such as packing out garbage when you return home from hiking or camping, staying on trails, and respecting animals and their habitats.

Wetside Story

CHARACTERS: ***PLAYED BY:***

Harry, the Heron

Dudley, the Duck

Bucky, the Beaver

Gilbert, the Goose

Patty, the Presenter

PATTY: A visiting goose is talking to some other animals about what a great place their home is to visit. He wishes he could stay but he is compelled to fly south each winter and north each summer.

HARRY (*stretching his long neck high*): What a beautiful day!!

GILBERT: Morning Harry!! I bet every day is beautiful in your marsh!

HARRY: Oh yes, but it's very fragile and threatened by human impacts such as pollution, and construction.

GILBERT: Well, I bet it's not as dangerous as migrating twice a year, dodging airplanes and buildings. At least you get to stay at home!

HARRY: You should ask Dudley about that! Yesterday I thought he had a new necklace but it turns out that he was diving for food and came up with this plastic ring around his neck. Bucky was going to try to chew it off today.

(Harry sees a fish and goes for it with his beak. Gilbert floats away and sees Dudley.)

GILBERT: Dudley, how are you? I heard about your new neckwear, have you seen Bucky about getting it off?

DUDLEY: He went to sharpen his teeth on a log. What a horrible feeling to have this thing wrapped around my neck, I was afraid I wasn't going to be able to eat or breathe! I hope Bucky can chew through it.

GILBERT: Do you know what it is or how it got here?

DUDLEY: Well Bucky said he had seen them before by piles of other materials like cans and bottles and that it's human pollution!

GILBERT: Oh! I bet they didn't mean to hurt anybody.

DUDLEY: Yeah well, they shouldn't have left their garbage to cause problems for others!! Great! Here comes Bucky!

BUCKY: Hi Gilbert! Okay Dudley are you ready?

DUDLEY: Yes, I'm very ready!!

(Bucky leans toward Dudley's neck and nibbles on the plastic ring until he chews through. Dudley shakes his head and rolls his neck.)

DUDLEY: I'm free, I'm free!!! Thank you so much Bucky, I must go show my family!

(*Dudley swims off happily*)

GILBERT: That was great Bucky, you're such a great friend! That makes this beautiful day even brighter!

BUCKY: I'm always glad to help a friend. I wish everyone was as considerate. This morning I found one of my dams destroyed and there was a large hiking boot print next to it!

GILBERT: Oh no! They didn't leave more garbage did they? Dudley told me about what happened last time.

BUCKY: Well, not too much this time! I sure felt bad for Dudley with that plastic ring stuck around his neck. I've heard of birds who died because they couldn't breathe with one of those things stuck on their neck. I was sure glad to help him out. I still remember our worst tragedy, when Harry lost his family, what a shame!

GILBERT: How did that happen?

BUCKY: Well, Harry and his wife had a nest set up and they had laid two eggs in it. Only one egg hatched, and then the weak baby Heron only lived for a week. Soon after Mrs. Heron died too. Harry sat by the nest for days. Then he noticed a smell and followed it to a flow of water trickling into the marsh. It turns out it was heavily polluted water coming from town businesses. I built a strong dam to filter the water before it comes into our marsh.

GILBERT: Oh my gosh, that's horrible!!

BUCKY: Yeah, it's not like it used to be. We used to all have bigger families and there was much more food.

GILBERT: Well, how can you teach these humans about the harm they're doing to your home?

BUCKY: Well, some humans are very gentle to our home. They just stop by to see birds, and don't leave garbage or break up my dams. Other humans come out to test our waters and count the different species. I think these people will have to educate their fellow humans about their influence on our home. Teaching humans not to pollute, damage, or take away our home is the only way we will be able to continue sharing this planet.

GILBERT: Wow, I didn't realize that humans had an impact on our homes, although there seem to be many more of them around than there used to be. I guess there are so many of them that they don't all know much about our homes yet.

BUCKY: No, many of the humans don't know about their impacts on our homes, but the ones that do are trying to help by educating others so we can all live in harmony.

GILBERT: Here come Harry and Dudley!

ALL: Good-bye everyone! Remember us the next time you visit wetlands!

PATTY: Let's brainstorm about animal homes, and ways we can lessen our impact on them!

WHAT KIND OF SHED DO YOU PUT WATER IN?

Focus	To develop the concept of a watershed using guided inquiry.
Group Size	Entire class
Time Required	15-30 minutes
Materials	Topographical map of the Cispus area Pencil Clipboard Crayons
Physical Setting	The Cispus Learning Center's Water Room, and Yellowjacket Creek or the Cispus River bank
Process	1. Students will look at the relief map in the Water Room and, through guided inquiry, develop the concept that water runs down hill and gathers at the low spots. A watershed is the area which feeds that low spot. 2. Go out to Yellowjacket Creek or Cispus River bed, in an area where students can see the surrounding hills. Using a topographical map, color in the watershed for Yellowjacket Creek and/or the Cispus River.

YELLOWJACKET POND DEVELOPMENT, INC.

Focus To use creative problem solving and simulation in commercializing a wetland area.

Group Size Entire class

Time Required 30-60 minutes

Materials *Per group:*

- Map
- Building and road icons sheet
- Paste/glue
- Yellowjacket Ponds cut-out sheet
- Construction paper
- Scissors
- Pencil

Physical Setting Main room in the education building

Process

1. Brief the counselors before beginning this activity.

2. Set the stage by giving general directions: each group is an interest group (groups should be made up of one or two cabin groups (6-12 students). The group decides where to place all of the components of a community, where materials are, what to do with the materials and where to put the finished product. The students will cut and paste the components of Yellowjacket Creek Development onto a sheet of construction paper according to their decisions.

3. Each group will be lead by a high school counselor who gathers the materials and *facilitates* the discussion about where everything should go.

4. When everyone is finished planning, tape the posters up. Have a spokesperson for each group tell where they put things and why.

Extensions:

The only limiting factors on extensions are time and imagination. A couple of possible extensions are:

1. A representative from each interest group meet to arrive at a compromise solution, which they then present to the entire group.

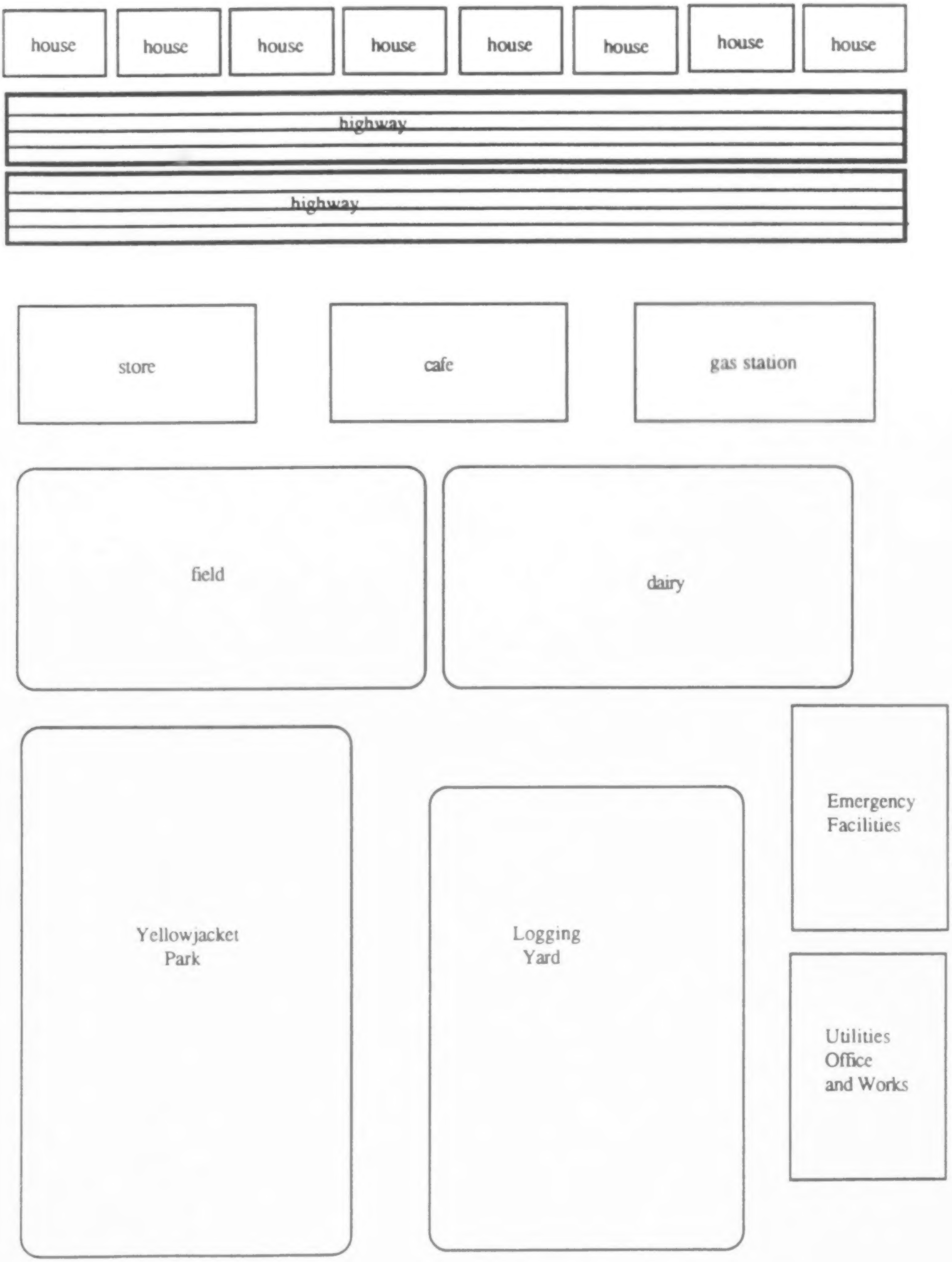
2. Who, or what, lives downstream from Yellowjacket Ponds? What effect does the outflow from the pond have on their lives?

Interest groups:

Farmers (field crops and dairy farms)
Small businesses (filling station, cafe, store)
Loggers and log storage areas
Utilities (power, sewage, water, fuel, garbage)
Parks department
Highways department
Home owners
Emergency facilities (medical, fire, police)

Possible Pros and Cons for Interest Groups:

PROS	CONS
Farms	
production of food	fertilizers and insecticides
part of the local economy	pollution, cause of erosion
Businesses	
part of the local economy	uses extra water, produces extra waste--creating water pollution
Homes	
provide protection and a sense of roots	produce additional water usage and waste production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Emergency Facilities
Utilities Office and Works

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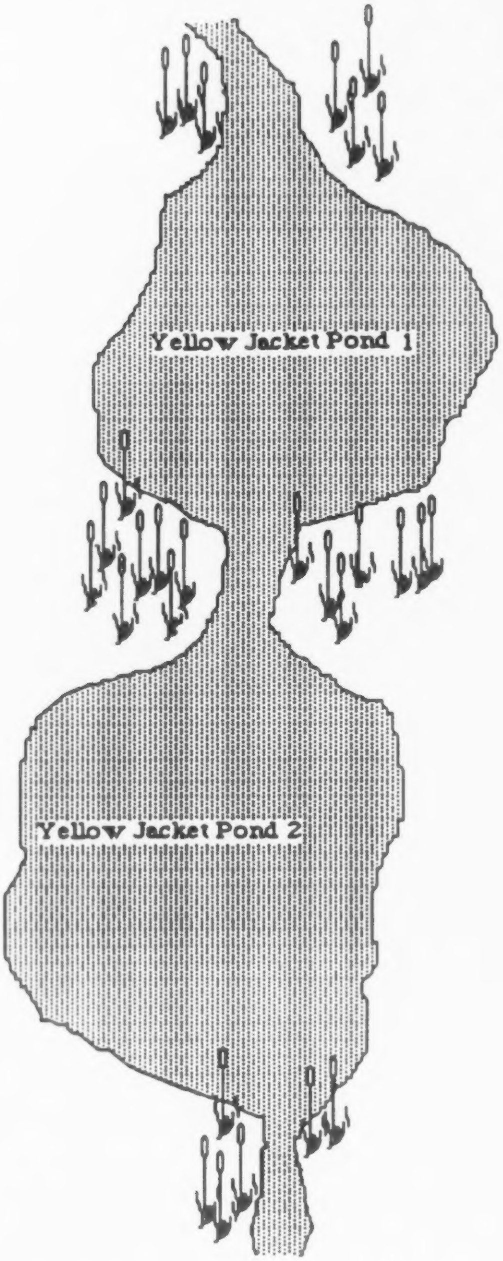
Yellow Jacket Pond 1
Yellow Jacket Pond 2

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The Green Stuff

trees and plants

ADOPT A TREE

Focus	To learn about a tree using guided inquiry and independent investigation.
Group Size	Entire class
Time Required	30 minutes
Materials	Clipboard Pencils (*lead or colored*) Cispus stickers Student Handouts: ***Tree Adoption Forms*** ***Tree Adoption Certificate***
Physical Setting	Wooded area with a variety of trees (*along one of the trails at Cispus*)
Process	1. Choose a tree to adopt. 2. Find a spot about 50 ft. from your tree and sit down to observe it. Notice the shapes and colors. Then, get up and touch the tree and examine it very closely. Record any signs of changes made by insects, larger animals or man. Decide the type of tree it is: coniferous or broadleaf, evergreen or deciduous. 3. Complete the ***Tree Adoption Forms***. First, make a sketch of your tree. You might want to detail parts that you particularly like (bark texture, leaves, roots). 4. Next, observe the area around your tree. Describe or name the types of plants that live around it. 5. Describe the types of animal life found on or near your tree. Describe the colors, sizes and any interesting features. Make a sketch of each animal you found. 6. Record your tree's name.

Tree Adoption Forms

Closely observe your tree. Describe any animal or insect signs (holes, webs, nests, droppings, feathers, etc.) that have been left on your tree. Make a sketch of your tree, including all of the details that make it unique:

Observe the area around your tree. Record its location in the plant community. Circle one in each category

TALLEST or **SHORTEST** **CROWDED AREA** or **OPEN AREA**

IN SUNLIGHT or **SHADED**

Did you find any man-made evidence? Describe:

Determine the type of tree you have. Circle two of the four types.

CONIFEROUS or **BROADLEAF** **EVERGREEN** or **DECIDUOUS**

Describe the kind of plant life around your tree:

LOCATION	COLOR	DESCRIPTION/SKETCH

Describe the types of animal life found near your tree:

SIZE	COLOR	DESCRIPTION/SKETCH

Tree Adoption Certificate

Date: ______Type of Tree: __________

Estimated age: _________Size:_________

Unusual details:

Your Given name for the tree:______________

Seal the tree adoption
by giving your tree a **big hug**
and attaching a
Cispus stamp

ALPHABET SALAD

Focus	To teach plant identification.
Group Size	Entire class
Time Required	30 minutes
Materials	Loose samples of available plant material
Physical Setting	Covel Creek Trail or Braille Trail

Process

Introduction:
Begin with an introductory lesson in plant identification. For information about plants at Cispus, *Plants of the Covell Creek Trail* is available in the office.

Activity:

1. Divide the class into two equal teams.

2. Place various samples of the available loose plant material into two piles.

3. Teams compete to be the first to separate the plants alphabetically by their proper names (Western red cedar, as opposed to cedar).

Discussion:
Follow up by re-identifying the contents and confirming that they've been properly sorted.

CREATE A TREE

Focus	To gain an understanding of the different parts of a tree and how they work together.
Group Size	Entire class
Time Required	20 minutes
Materials	No additional materials
Physical Setting	An open area , clearing on a trail
Process	*The idea is to create a tree and its elements using people as the building blocks. Read the instructions to the students as they go through the activity--explaining the roles of the different elements as they are created.*

1. One child volunteers to be the **Heartwood** of the tree. He/she will stand up straight and sturdy, ready to support the following layers of the tree. To symbolize the heartwood, the child will thump her/his chest, simulating the sound of a beating heart.

2. The next element is the **Cambium** layer, the distinct, formative layer that lies between the Heartwood and the bark. It's here that water and nutrients flow up and down the tree, within the vascular tissues of the xylem and phloem. To represent the cambium, three or four children will clasp hands to form a ring facing inward, and surrounding the Heartwood. To show the flow of nutrients through the tree, the cambium will move their clasped hands, saying "UUUUUUP" and "DOWWWN" to match the movement of their hands.

3. Surrounding the cambium on a tree is the protective outer layer called **Bark**. To act out bark have six or more students surround the cambium layer, hook elbows (to symbolize a protective barrier) and face outward. These students will "BARK", like a watchdog, further symbolizing the protection bark provides a tree with.

4. Now the **Roots** must be made, so the tree can gather nutrients and water. Five or more students lie down with their feet pointing away from the tree circle and their hands to their sides. To simulate the intake action of the roots the children wiggle their feet and hands and make loud slurping noises.

5. The last elements are the **Branches** and **Leaves**. They are needed to acquire sunlight and produce energy through photosynthesis. To symbolize branches the remaining students put one arm on a Bark student, and have the other outstretched toward the sky, wiggling fingers on the free hand are their leaves. These students will "HUMMM" to represent the process of photosynthesis. If there are a lot of students, have those remaining be leaves by joining a hand to the branches and stretching the other to the sky. The branches will "RATTLE" and the leaves wil make the photosynthetic "HUMMM".

Variations:

Add the element of wind into the game and make the tree sway. Pretend the sun is shining brightly and have the leaves humm louder, then have the weather become overcast and start to rain. Use your imagination and have fun!

IN THE NURSERY

Focus	To learn about the *re-cycle* of the forest through field study.
Group Size	15-20 students
Time Required	30-60 minutes
Materials	Field study notebook (*Discovery Journal*) Drawing pencils Measuring tape.
Physical Setting	Braille Trail, Covell Creek Trail, or Yellowjacket Ponds Trail

Process

THE NURSE LOG:

In our living world all plants and animals are part of the cycle of life. A nurse log is a perfect example of this cycle. Moisture and decay soften the wood, providing a fertile environment for new plant growth. The size, quantity and variety of plants growing on the nurse log tell us much about the forest. Signs of animal life can be found in and near the log.

Take the students to a nurse log to discuss and answer the following questions. Descriptions and questions in this unit can be either used in a verbal question-answer format or as written responses from the students.

1. Describe the setting your nurse log is located in:
   - a. How close to a stream is it?
   - b. How deep in the forest is it located?
   - c. How much sunlight does it get and during which part of the day does it receive the sunlight?
   - d. Is part of the nurse log more exposed or protected than another part?

2. Describe the log itself:
   - a. How long is it?
   - b. What is its diameter?
   - c. Are the ends vertical, or do they show evidence of decay and erosion?

3. Fungi:
   - a. Do you see any mushrooms on the log? If so, describe them.
   - b. Where are the mushrooms growing?

4. Mosses and lichens (simple green plants):
   a. Are mosses and lichens growing on the log? Where are they? On dry or moist areas? Shady or sunny areas?
   b. What colors are the lichens and mosses?
   c. Do you see spore caps? What color and shape are they?

5. Ferns:
   a. Are there any ferns on the log?
   b. If so, where do you see them?
   c. Are they in fiddleneck state or do they have spores on the underside of the fronds?

6. Flowering Plants:
   a. Do you see any flowering plants?
   b. If so, describe them. Are they fully leafed out? Are the flowers in bloom? What colors are the flowers?

7. Woody shrubs:
   a. Twin flower, blackberry, salal, and vine maple are often rooted in nurse logs. Do you see any of these?
   b. Where are they located?
   c. Describe their growth characteristics (vine, erect, other)
   d. Do you see any other types?

8. Trees:
   a. Have trees taken root in the nurse log?
   b. What kinds of trees are they?
   c. How large are they?
   d. On which part of the log are they located?

9. Animals:
   a. What kinds of animals, or evidence of them, do you see living in, on, or near the nurse log?

10. Soil in the making:
   a. How have the plants and animals you've identified helped to decompose the fallen tree and change the wood into new soil?

11. The tree that was:

Now that you have studied the nurse log in detail, try to imagine how it looked as a standing tree.

   a. How tall was it?
   b. How old?
   c. What plant life grew under it?
   d. Did birds have nests in its branches?
   e. What caused it to fall?

Compare your nurse log to either a newer or older nurse log, or a stump.

   a. How are they alike?
   b. How are they different?
   c. How do the kinds of plant life compare?

The Nurse Log

Labeled close-ups

KING OF THE FOREST

Focus To use guided inquiry in investigating old growth forest.

Group Size Entire class

Time Required 2.5 hours (*45 minutes travel each way included from the Cispus Center*)

Materials
25' measuring tape
Writing utensils
Handout:
King of the Forest worksheet
The Wild Wild World of Old-Growth Forests teachers guide *(available in the Cispus office)*

Physical Setting Old growth forest setting (**Quartz Creek Big Trees**)

Process

Activity 1: GETTING THERE

1. From the main entrance of the Cispus Center turn right onto Cispus Road. This is road 76. Follow it to the Iron Creek campground area where it intersects with road 25.
2. Turn right and drive for less than a mile, then turn left onto road 26.
3. After driving about 8 miles look for road number 2608. Turn right. This is the turn-off to Quartz Creek Big Trees. Drive a little over a mile on this gravel road.
4. Park in the area provided and follow the barrier free trail for a short walk to this marvelous grove of trees. The "ooo's," and "ahhh's," should start now.

Activity 2: THE LESSONS

1. There are many activities that can be carried out here. Use the exercise provided on the ***King of the Forest*** handout, or select those you like from ***The Wild Wild World of Old-Growth Forests*** (The Wilderness Society teachers' guide).

King Of The Forest

1. The "King" of the forest is usually the biggest and oldest plant or animal in a forest community. **WHO** is the King in this forest community?

2. **WHAT** other kinds of plants and animals share this forest community? How many other different kinds of plants share this community?

3. **HOW** might the members of this community assist each other?

4. **HOW** many feet around is the big tree closest to you (measure about 4 ft. from the forest floor). How many kids will it take to reach around the tree if you're all holding hands?

5. **ESTIMATE** the age of this tree:

6. **HOW** do you feel being around these majestic trees and their community? **WRITE** what comes to your mind as you think about these trees.

7. **WHAT** other animals probably interact with this forest community?

NAME THAT PLANT!

Focus To reinforce knowledge of plant identification. *This game dovetails nicely with* ***Alphabet Salad.***

Group Size Entire class

Time Required 20 minutes

Materials Loose samples of available plant material

Physical Setting A forest with available plant material

Process *If* ***Alphabet Salad*** *was not played beforehand, or if the students have little knowledge of plants, begin with a lesson on plant identification. For information about plants at Cispus, Plants of the Covell Creek Trail is available at the office.*

1. Separate students into two teams.

2. Pile ***Alphabet Salad*** or other loose samples of available plant materials into one space. Students then line up 15 meters away from the pile.

3. When the instructor names a plant, two students (one from each team) race to find a sample of that plant and return with it . The first back, with the correct plant, scores a point for their team. Try to trick'em! Frustration is a fantastic teacher.

SPRING WILDFLOWER WALK

Focus	To illustrate several adaptations of wildflowers to a dense forest environment.
Group Size	Entire class
Time Required	20 minutes
Materials	This sheet, field guide, or Plants of the Covell Creek Trail *(available at the Cispus office)*
Physical Setting	The Braille Trail

Process

This walk was written in May and includes flowers in bloom at the time. Of course, it can be done in other seasons with other flowers, illustrating the strategies of blooming early or late, or in combination with other plants.

The walk begins at the end of the Braille Trail. All around on the "understory" or forest floor level is a lush carpet of:

1. **Wood Sorrel** or **Oxalis** (***Oxalis oregana***)
The giant clover-shaped leaves are on a horizontal plane to better catch the sparse sunlight filtering down through the forest canopy. They have a white, peppermint striped flower about an inch in diameter.

References

Mathews, Daniel Cascade-Olympic Field Guide. Raven Editions, 1988.

Whitney, Stephen. Western Forests (Audubon Society Nature Guideseries). Alfred A. Knopf, 1985.

mixed in with the oxalis are:

2. **Anemone** (***Anemone deltoidea***)
Here found interspersed with the Oxalis, is the Anemone's flower spike. The white 1-2 inch flower stands up above the broad Oxalis leaves and competes for sunlight. Its leaves are also horizontal to the ground. The three oval, tooth-edged leaves form a ring around the stalk.

3. **Inside-Out Flower** (***Vancouveria hexandra***)
The small (half-inch) white flowers hang over off of a spike above the oxalis level. The leaves are shaped like a duck's webbed foot. Why do you think this flower is called "inside out"? What advantage might there be in this position? Facing upward, the flowers might be more easily found by pollinators, or catch moisture in the flower "cup".

3. **Vanilla Leaf** or **Bat Flower** (***Achlys triphylla***)
These large (6-10 inch) leaves are shaped somewhat like a moose's antlers and stand above the oxalis level. The leaves are horizontal groupings of three that are spread to catch the sparse sunlight. The flower spike, with its tiny white flowers, stands 1-1 1/2 feet above the forest floor to be visible to pollinators.

Creepers, Crawlers, Runners and Flyers

animals, insects, and interrelationships

ANIMAL SUPER SLEUTH

Focus To use field investigations and creative problem solving in observing and recording evidence of animals along the Cispus River.

Group Size 10-12 students

Time Required 1 hour

Materials

Entire group:
Animal track guides
Spray shellac
Plaster of Paris
Vaseline
Tagboard (or thin cardboard)
Paint

Per student:
Pencil
Clipboard
2 small milk cartons
Handout: ***Sleuth Sheet***

Physical Setting Cispus River

Process

Activity 1:

1. Prepare the milk cartons before your class begins. Fill each carton, one per student, 3/4 full of Plaster of Paris powder. It's best to keep all these filled cartons together in a box during the hike to the river.

2. Discuss the animals that are found in the Cispus area (there is a chart outside the Library that has a record of wildlife sightings in the area). Explain that the Cispus river is an area where many animals will come to drink and to graze on plants. Discuss evidence that could be found in the sandy areas along the river.

3. Take the trail past the Pavilion and on to the Cispus river. **Caution** students to look carefully before they walk to avoid damaging any prints that may be in the sand.

4. When you find a track, record your observations on the record sheet, write a description of the area where you found the track, and draw a picture of it. Then try to identify the track.

5. Next, using your imagination, recreate the scene when the animal was here. What was it doing? What did it see and hear? Write or draw your ideas on the record form.

6. *Make an impression cast of the track:*

a) Using a stick, draw a square around the track in the sand. Put the stick into the ground on the outside edge of the square.

b) Carefully clean away any debris from the track, then spray it with shellac.

c) Encircle the track with a 2" band of tag board.

d) Take one milk carton filled with Plaster of Paris and another carton filled with water from the river. **Slowly** mix water into the powder, stirring until it is the consistency of thick pancake batter.

e) Pour the plaster mixture over the track. Allow time for the cast to harden (15-30 minutes, depending on the weather). Put the clean milk carton upside down on your stick to mark your track so that you can find it later.

f) When it's hard, lift the impression cast carefully and mark it on the back with your name. Pick up any debris left in your area and take the cast back to camp. Clean it carefully and coat with vaseline.

7. *Make a relief cast using the impression cast:*

a) Surround the impression cast with a wide strip of tagboard and pour plaster into the track, level with the mold.

b) When this is hard, separate the two layers of casting. Clean vaseline from the casts and smooth with sandpaper or a knife blade.

c) When the relief cast is very dry, students may paint the inside of the track.

Activity 2:
When you return to school, do an in-depth study of the animal who made your cast track. Give an oral report which includes your on-the-scene observations and plaster cast.

Sleuth Sheet

Carefully locate an animal track. Describe the area (include any other tracks, plants, and insects) and draw it below:

Draw the track

Animal identity: ______________________________

From your observations, recreate the scene during the time the animal was in this location. What events took place? What was this animal doing? What did it see and hear? Draw or describe in words what you think happened:

BLIND CREATIVITY

Focus
To experience the bird blind at Cispus while sketching or writing, preferably after a lesson on birds or wildlife. Can be used in conjunction with ***DISCOVERY JOURNAL***.

Group Size
Entire class (*due to limited space, only 10-12 students per visit*)

Time Required
30 minutes

Materials
Paper and pencils
Clipboards and bird seed (*housed in the bird blind*)
Bird I.D. book and bird blind key (*available in the front office*)

Physical Setting
Bird blind (*south side of the center, near the playground and archery station*)

Process

Activity 1: ATTRACTING BIRDS
To insure a good bird turn-out, plan to do this lesson later in the week. Upon arrival assign a counselor and his/her cabin group to feed the birds at least once a day, starting immediately and continuing until the lesson is done.

Activity 2: WATCHING BIRDS
1. Take the students to the bird blind and have them find a seat near a one-way window. Hand out clipboards and have everyone get their paper and pencils out and ready to use.

2. Review the pictures on the bird blind walls showing local birds and the characteristics used to identify them. These are resident birds at Cispus. Discuss what "resident" means. Take at least five minutes to observe the birds. Everyone should be as quiet as possible to avoid scaring them away.

3. Each student can choose to sketch the birds and their setting, or write a creative story, journal entry, or poem.

COMPLETE THE CYCLE

Focus	To provide basic information about what materials are necessary to construct a good compost pile. Students will also gain an understanding of how composting reduces household wastes.
Group Size	Entire class
Time Required	1 hour
Materials	Pencils Organic wastes from the kitchen Worm bin and plastic food collection container from the office Handout: ***Composting Questions***
Physical Setting	Large classroom in the education building.
Process	1. Request the worm bin and food collection container. 2. Using the plastic food collection container from the office, have the students collect their lunch scraps. Make sure that there are no bones, meat, grease, or other materials that may attract rodents and pests. Tell the students to collect the wastes inside the plastic container, but not to overfill it. After the wastes have been collected, weigh the container to make sure that the materials do not weigh over 3 pounds. 3. Have the students spread the kitchen scraps over the top layer of dirt in the bin. Then have them sit down and discuss the questions on composting. Explain to the students that the composting will take about 2 days, and that they return later to see what the worms have eaten.

Additional Resources

(taken from A-Way With Waste curriculum guide, a program of the Washington State Department of Ecology)

Peterson, Christina, et al. Energy, Food and You, Secondary Guide. Seattle, WA.: Washington State Office of Environmental Education, Northwest Section, 1983.

Dindal, Daniel L. Ecology of Compost: A Public Involvement Project. Syracuse, N.Y.: Office of Public Service, State University of New York, 1976.

Rodale, Robert, Ed. The Basic Book of Organic Gardening. New York, NY: Bobbs-Merrill Co., 1975.

Organic Gardening and Farming Staff and Ed. "The Compost Heap that Grew into the 14-Day Method," Calendar of Organic Farming: A Guidebook to Successful Gardening Through the Year. Emmaus, PA: Rodale Press, Inc., 1973.

Phone Numbers

City of Seattle Composting Hotline: (206) 625-2089 (Seattle Engineering Department, Solid Waste Utility)

King County Extension Service: (206) 344-7984, 9:00a.m.-1:00p.m. (Tape No. 444 "Making a Compost Pile")

Composting Questions

1. What is composting?

2. What are the necessary "ingredients" for starting a compost pile or worm bin?

3. Name some similarities between composting and recycling--how are the two processes related?

4. How does composting reduce waste?

5. What are the benefits and advantages of composting?

6. Give some examples of places composting occurs naturally:

DIFFICULT DECISIONS

Focus	To provide stimulus for personal decision making on the issue of animal rights. *Adapted from an article by Jal S. Parakh and Irwin L. Slesnick, biology dept. Western Washington University.*
Group Size	Entire class
Time Required	1 hour
Materials	Handouts: ***Who Decides?*** ***Questions and Decisions***
Physical Setting	Standard classroom
Process	1. Allow the students time to read the handout and answer the questions. 2. Divide the class into small groups, no more than six to a group. Have them discuss their answers and the reasoning behind them. 3. If there is time, have the whole class discuss and draw-up guidelines for animal use in research (medical, commercial), manufacturing (clothing, hygiene/cosmetic products, medicines), product testing (cosmetic, medical), and food production.

References

Fox, M.A. (1986). *The Case for Animal Experimentation: An Evolutionary and Ethical Perspective*. California: University of California Press.

Regan, T. (1983) *The Case for Animal Rights*. California: University of California Press.

Singer, P. (1975). Animal Liberation: *A New Ethics for Our Treatment of Animals*. New York: Random House.

Tannenbaum, J., and A.N. Rownan. (1985). "Rethinking the Morality of Animal Research." *Hastings Center Report*, 15(5):32-43.

Who Decides?

Throughout history, humans have used other, nonhuman, animals in scientific research. Each year millions of animals are used for research in medical experimentation and the toxicity testing of thousands of compounds, from pesticides to household products and cosmetics. As the use of animals in research increases, so does the opposition to its use. Some antivivisection (*vivisection* : experimental research on a living animal for medical purposes) groups believe that all animal research should stop, while some researchers feel that any experimentation in pursuit of new knowledge should be allowed.

One of the points of debate has been whether all sentient vertebrates (animals with backbones that are capable of feeling--conciousness) have rights. The struggle to decide if and/or what these rights might be has lead to protests, demonstrations and break-ins at animal research labs. Although the debate still continues, there are three ethical positions that seem to cover the majority of views. These are dominionism, abolitionism, and utilitarianism (Tannenbaum and Rownan, 1985). The basis for these viewpoints are listed below, along with some of the objections to them.

DOMINIONISTS	ABOLITIONISTS	UTILITARIANS
	OPINIONS	
•nonhuman animals have no rights •there are no moral boundaries on animal use, even for trivial human purposes •cite a passage from Genesis stating that God gave humans dominion over all other creatures	•animal reasearch is morally wrong because animals have the same rights as humans •if humans have a right not to be harmed, then so do other animals •prejudice in favor of humankind is "speciesism"	•animals have rights •the pain and death of nonhuman animals is outweighed by the research-related reduction in death, disease, and suffering of humans and other animals
	OBJECTIONS	
•the passage from Genesis is being used selectively, there is also a passage in Genesis about the stewardship of humans to animals	•rights are seldom absolute, and when the rights of humans and other animals compete, human rights are first	•how do we set the standards for weighing good and bad?

Questions and Decisions

1. Is there a difference between using animals for food or clothing and using animals for research?

2. Should a medical research center be allowed to use thousands of test animals in research on plastic surgery (for cosmetic purposes, to correct a congenital defect)? What about research on a fatal disease?

3. Some research involves little or no pain to animals, or any shortening of their life spans. Other research involves significant animal pain and death. Should we consider these factors when deciding whether to allow certain research projects, or should we only look at the possible beneficial outcomes of the experiments?

4. Do researchers have the right to experiment on animals for the sake of knowledge alone? For example, do scientists interested in brain anatomy have the right to operate on cats' brains, causing the cats permanent disabilities?

5. Do cosmetics manufacturers have the right to test the safety of a new eyeshadow or lotion by placing samples of these products in rabbit's eyes? Do you think new products should be sold without first undergoing safety tests?

6. Does it matter what kinds of animals are used in animal research? Is it "more alright" to use a worm or other invertebrate, than to use vertebrates such as rabbits and dogs?

7. What alternatives can you think of to using animals in research?

8. What scientific discoveries have been made without the use of animal research?

9. The ability to reason, to communicate, and to be conscious of one's mortality are among the differences between humans and other animals that often are cited to deny claims that nonhuman animals can have rights. If these criteria are to determine possession of rights, then what rights are held by fetuses, newborns, and people in irreversible comas?

10. Reformers and animal protection advocates often propose the following guidelines:
    I. Only permit experiments that will lead to a significant increase in our knowledge.
    II. Repeating the same experiments with different species of animals is unnecessary and should not be permitted.
    III. Alternatives to animals, such as computer simulations and tissue cultures should be used to test drugs and other chemicals.

To what extent are the above restrictions realistic in terms of the nature of science?

11. The Draise test, which involves applying cosmetics and household products to the eyes of rabbits, and the LD 50 test, which involves finding the dose of a substance that is lethal to 50% of the animals exposed to it, are both controversial on scientific and humane grounds. Have students investigate the arguments for and against these tests.

12. Should all living things--bacteria, plants, worms, mammals--be equally protected from the "abuse" of scientific research? Do all life forms have equal rights?

ECOSYSTEMS

Focus To understand the cyclic relationships between earth, water, plants, humans, and animals.

Group Size Entire class

Time Required 1.5 hours

Materials

Compass	Twine
Metric tape measure	Hammer
Stakes	Magnifying glass
Dentist mirror	Discovery Journal
Handouts: ***Plot Descriptions***	

Physical Setting Flat area supporting a variety of plant and animal life

Process

Activity 1:
Complete ***A Window Into The Past***, or discuss cyclic relationships and food webs before going out.

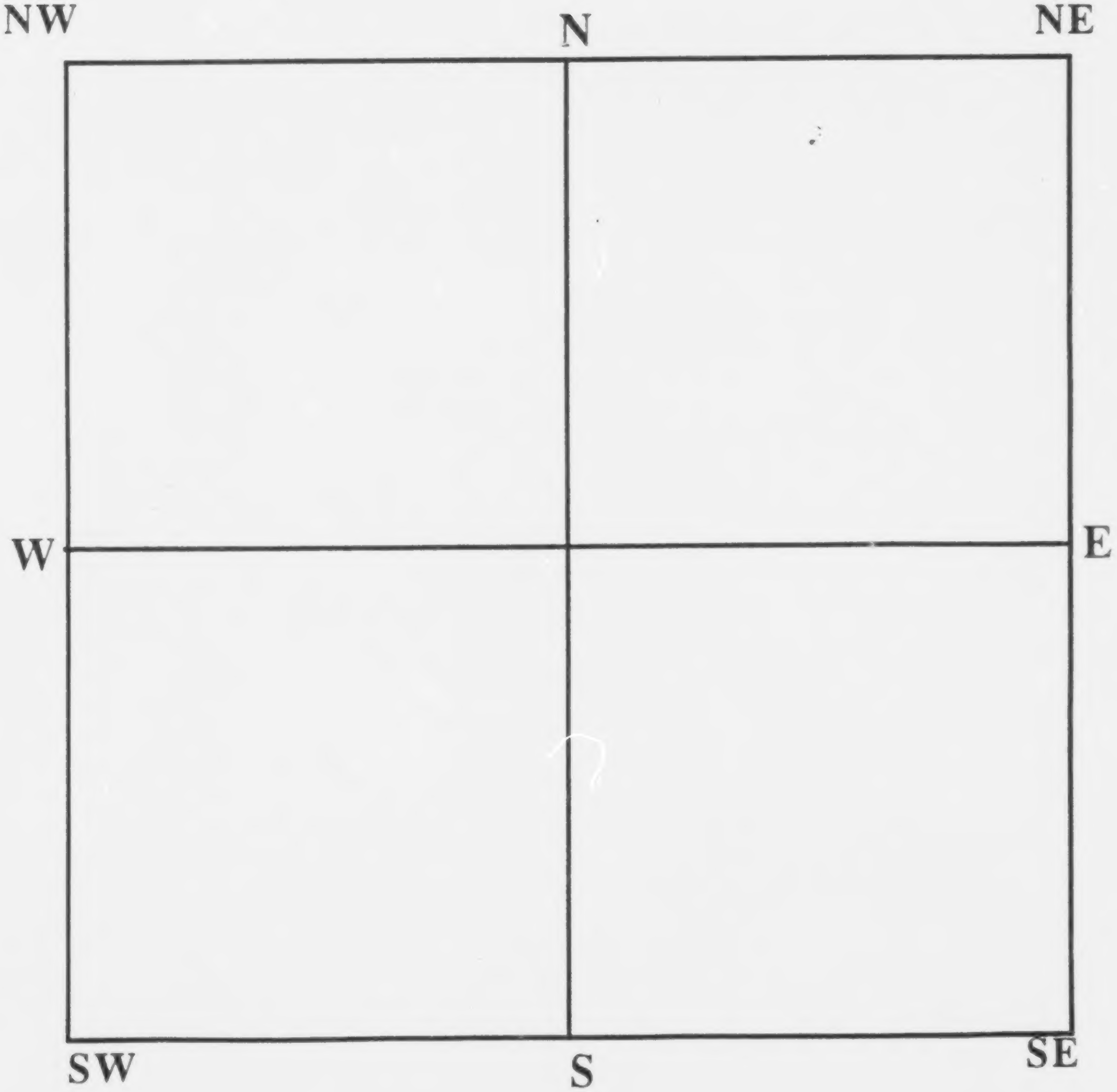
Activity 2:
1. Divide the students into groups of eight. Measure out a one-meter square "ecoplot" for each group. Use compasses, metric tape measures, stakes and twine to construct the borders and quadrants of the plot.
2. Discuss and identify the plant and animal species you expect to find. Then, make a detailed count of the plants and animals that are inside your ecoplot. Write all of the information into your Discovery Journal.
3. Complete the site information about your plot. Then, divide into pairs and assign each pair to a quadrant of the original square. List the plants and animals you discover.
4. Compile the information you collected about your plot. Make a sketch of it.

Activity 3:
1. Using a dental mirror, look at the underside of twigs, needles, mushrooms, etc. in your plot. Note the patterns and textures of the things you see. Write descriptive sentences for these "mysteries of the underworld".
2. As time allows, share the mysteries of the underworld as a guessing game.

GUIDELINES

- We are counters of what is there
- We may need to move leaves aside to see what is under them; we will do so carefully
- We will make a minimum impact on the environment
- We will take only information
- We will leave only footprints

Plot Descriptions


NW
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Mysteries of the Underworld

1

2

3

4

5

6

7

8

Non-Living	**Invertebrates** (identify Mollusks, Annelids and Arthropods)	**Vertebrates** (identify Amphibians, Reptiles, Aves, and Mammals)

Green Plants

(identify Fungi, Lichens, Mosses, Ferns, Flowering Plants, Woody Shrubs, and Trees)

HERE TODAY, GONE TOMORROW

Focus To introduce active role playing that will allow students to learn and discuss their thoughts on the effect humans have on animals and habitat.

Group Size Entire class

Time Required 1 hour

Materials No additional materials

Physical Setting Large classroom or outdoors

Process 1. Divide the students into equally sized groups of: Grizzly Bears, Wolves, Leopards, Poachers, Farmers, Loggers, and Tourists.

2. Have the animal groups come to the front of the room. Explain their situation to each group: Leopards are roaming around freely in the high mountain areas, Grizzly Bears are roaming around the forest mountain areas eating berries, and Wolves are running and hunting in the forest mountain areas.

3. Separate the other groups into different areas of the room and explain that they are going to go into the areas where the animals are and impact their habitat in some way. Loggers will cut down trees, Farmers will go into the habitat and use it to grow crops and livestock. Poachers will shoot or trap animals for trophies. Lastly, Tourists will make trails and campgrounds in each of the habitats. Whenever one of the groups impacts the animal habitats, tell one animal from each group to sit down because they couldn't survive the change to their environment (a variation would be to allow the students to decide how many animals the human activity would kill).

4. Continue with each human group impacting the habitats (pollution of water from logging, pesticides and chemical fertilizers, erosion of hills from improper trail use, waste left by humans, etc.) until all the animals are dead.

Discussion:
1. What can be learned from this exercise about human activities like hunting, poaching, farming, and tourism and their effects on animal habitats?

2. Do you think one activity was more impacting than another, or was the combination of activities more damaging?

3. What do you think humans can do to lessen their impact on animal habitats and help endangered animals survive?

INSECT SLEUTH

Focus To use field study techniques and problem solving skills in finding and identifying aquatic insects in Yellowjacket Ponds.

Group Size Entire class (*divided into groups of 5*)

Time Required 1.5 hours (*hiking and exploration time*)

Materials

Per group:
Collecting nets
Aquatic insect notebooks
Pencils
White dishpans
Clipboards
Handout: ***Insect Mystery Sheet***

Physical Setting Yellowjacket Ponds

Process

1. Before leaving for Cispus, use classroom time to design a field guide to the aquatic insects in the Cispus area. Students write a description and then draw a picture of each insect. A useful resource for this activity is the aquatic insect guide prepared by Cispus staff (ask in the office). Make overhead transparencies of the insect sketches to give the students a guide to draw from. These student-created guides will help them with identification at the Ponds.

2. Take the trail to Yellowjacket Ponds. Discuss the fact that the Yellowjacket Ponds are an aquatic habitat and home to a variety of plants, animals, and insects. Together, create guidelines that will allow them to collect and release insects, while doing the least damage possible.

3. Student groups, with a counselor as leader, spread out around the ponds and begin collecting. When they catch an insect, they put it in the white dishpan. Using their guides, they look up and name the organism they have found. Then they record their finds on the worksheet, making a sketch of the insect, describing how it moves, where it was found, and the scientific identification.

Insect Mystery Sheet

Insect Sketch	**Insect Description**	**Insect Name**

LITTLE BROWN BATS

Focus	To give the class general information and understanding of a species of bat commonly found in the Cispus area.
Group Size	Entire class
Time Required	1 hour (*additional time for evening visits to the roost site at the U.S. Forest Service building overhang, street lights, or the bat boxes around the Center*)
Materials	Bat specimen Bat illustrations Handouts: ***The Little Brown Bat*** ***Bat Questions***
Setting	Standard classroom (*with outside visits to roosting sites and hunting areas in spring and summer*)
Process	1. Read ***The Little Brown Bat*** story to the class, or let them read it on their own. 2. Divide the class into groups of 5 or 6 (group sizes can vary with class size) and let them discuss and answer the question sheet, referring to the story, diagrams, and provided specimen as necessary. 3. After a sufficient discussion time has elasped (20-30 min.), discuss as a class the various observations and answers generated by the groups.

Further Reading

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Leen, Nina. (1976). *The Bat.* New York: Holt Rinehart and Winston.

Mohr, Charles E. (1976). *The World of the Bat.* Philadelphia, New York: J.B. Lippincott Co.

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The Little Brown Bat

BY LORENE SANFORD

Myo lives in the overhang of the U.S Forest Service (U.S.F.S.) building at Cispus. She is a Myotis lucifugus, or little brown bat. Myo is about 84-98 mm long, has a wing span of 33-40 mm, and weighs about half an ounce. Myo's coat, or pelage, is soft and thick with a shiny cinnamon or dark brown color on her back, and a buffy brown to pale gray on her sides and stomach. Little brown bats live in various forest habitats and usually live near a source of water, like Covell Creek. They like to make their homes, or roosts, in caves, tunnels, hollow trees and buildings where they live together in groups called colonies. Myo's colony of little brown bats lives in the overhang of the U.S.F.S building, where they can find plenty of moths, flies and mosquitoes to eat under the streetlights when they go out to hunt at night.

Right now, Myo is resting. Her feet hold her in place while she hangs upside down, sleeping on her perch. Myo's thin wings are made of two layers of skin called a membrane, they are stretched between her long finger bones, legs and tail in much the same manner that webbing is stretched between the toes of a duck (fig. 1). When she sleeps, Myo wraps her wings around her body, the way you would wrap a blanket around yourself at night to keep warm. When dusk arrives Myo, and the other bats in her colony, will begin to wake-up and groom themselves. Bats groom themselves often: when they wake-up in the evening, before they eat, after they eat, and while they are resting. Using their feet they clean the soft fur on their bodies, their pointed teeth, and their thin, supple wings.

When she is finished grooming, Myo flies to Covell or Yellow Jacket Creek for a drink of water. Swooping down to the surface of the creek, she opens her mouth and scoops up a drink of water with her lower jaw, then flies up into the air to begin hunting for her dinner. Using a method called echolocation to find her prey, Myo beams arcs of ultrasonic sound out of her mouth and into the air ahead of her as she is flying (fig. 2). These sound arcs bounce off of objects in her path, and the returning echos tell Myo where and how far away the objects are. The shape of Myo's ears, nose and mouth are all developed to aid in the accuracy of echolocation. Her ears are large and long, set far apart on her head and cupped to capture sound. She also has a tragus, or lance-like projection in front of each ear that helps to channel sound into her outer ears (fig. 1). Because she sends the ultrasonic sounds out through her mouth, Myo's mouth is grooved and wrinkled to have better accuracy in directing the sounds. Some of Myo's cousins send ultrasonic sounds out through their noses. They have folds of skin around their noses that are shaped like leaves, spears, snouts, and horshoes, depending on the different species. These features are called nose leaves and do the same thing that the grooves and wrinkles on Myo's mouth do—direct and project the ultrasonic sounds that the bats use to guide themselves in the dark and find their food.

As she hunts, Myo swoops and dives, flexing her knuckles to change the shape of her wings, and using echolocation to search for her dinner. When she locates an insect, Myo chases after it until she is close enough to throw her legs forward, forming a pouch with her tail membrane, then she scoops the bug into the pouch with her wings. Myo then ducks her head down to snap up her treat. By herself, Myo can catch and eat as many as fourteen insects in a minute. With appetites like that, even a small colony of ten to fifteen bats can be very effective in controlling insects in the area around their roost. Myo and her colony will continue to hunt for most of the night, returning occasionally to the creek for a drink of water. As the sun begins to rise, Myo catches one last mosquito and then heads back to the roost, where she will sleep away the daylight hours.

This spring, Myo is preparing to have a baby. Last fall, before she went into hibernation, Myo mated with a male little brown bat. She has stored the live sperm all winter long in her reproductive tract, waiting for springtime, when it will be time for her to ovulate. This will allow her egg and the stored sperm to meet inside her reproductive tract and then grow into a baby bat. About eight weeks after the egg is fertilized, Myo will give birth to a little brown bat baby. Many of the other females in her colony will also be having their babies between May and August, and the building overhang will be filled with the squeaking of baby bats. When the time comes for Myo to give birth, she will raise her body up, grasping the perch with her thumbs, and then let go of the perch with her feet; so that she hangs upright with her thumbs supporting her body. Then, Myo will tuck her tail forward and up between her legs, forming a little pouch with her tail membrane. This pouch will catch the baby when it is born and keep it from falling to the floor and being injured. Myo's baby will be born feet first, and as soon as its' feet emerge, Myo will tear off the birth sac surrounding the baby. Then the baby will help Myo in its own delivery, by grasping and pulling with its feet. The delivery will be over in about fifteen to twenty minutes, but the umbilical cord connecting Myo to her baby will remain intact for another ten minutes; in which time it will dry up and break on its' own. If the cord were cut or broken immediately after birth the baby would bleed to death. The newborn bat (Little M) will be naked, with its eyes closed and its ears pressed close to its head. Little M will look something like a winged, baby mouse, and weigh between 1.45 to 1.55 grams. Right after it is born, the baby bat will start to nurse, and continue to do so until Myo goes out to hunt at night. Then, Myo will leave Little M perching in the overhang, while she looks for food; coming back every hour to nurse her baby. A bat's childhood is very short. Within a few days Little M's eyes will open, and after about two weeks the baby bat will be half-grown and covered with wooly, sooty gray fur. By then, Little M will no longer hang onto its mother to nurse, instead it will roost beside Myo in the overhang and hunt with her at night.

The little brown bat colony will continue to feed during the Spring and Summer; building up a store of fat to sustain them during the winter when there will be no insects to feed on . When fall arrives, the little brown bats will begin their mating season, ensuring a new generation of baby bats next year. Then, Myo and her colony will group together under the overhang and sleep away the winter, anticipating the arrival of spring.

Bat Questions

1. Compare the structure, texture, and uses of a bat's hands to your own.

2. What does your home have in common with Myo's roost? What things are different?

3. Compare the way you use the senses of touch, sight, and sound to the way Myo uses them.

4. What things do bat babies and human babies have in common? What things are different?

5. Why do you think it is helpful to have bats around?

6. What would you do if you found a bat inside your house?

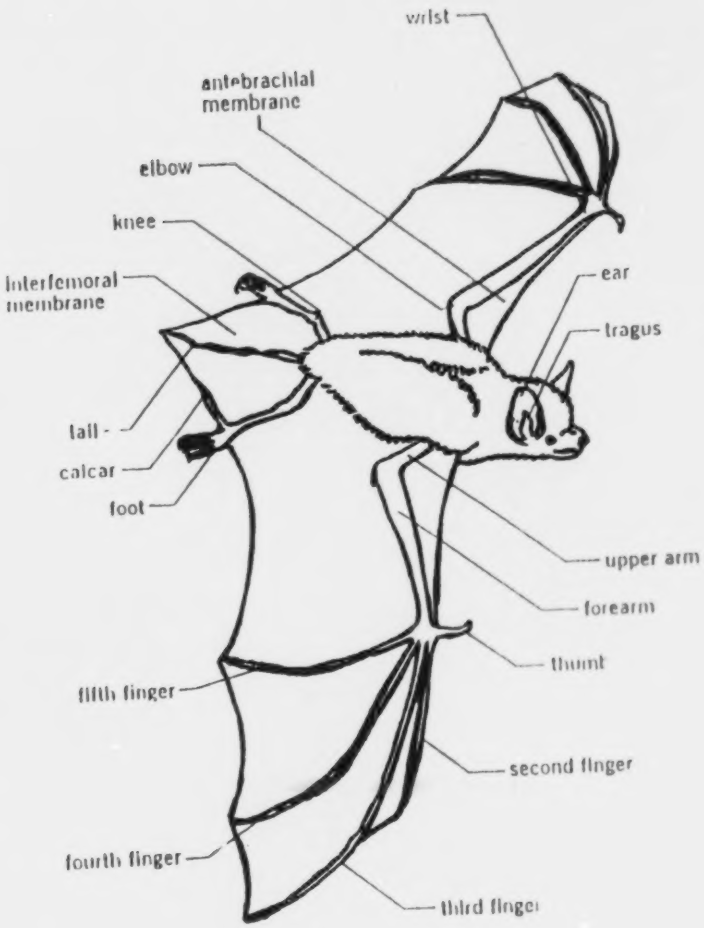
wrist
antebrachial membrane
elbow
knee
interfemoral membrane
tail
calcar
foot
ear
tragus
upper arm
forearm
thumb
fifth finger
second finger
fourth finger
third finger

Figure 1: Bat Anatomy

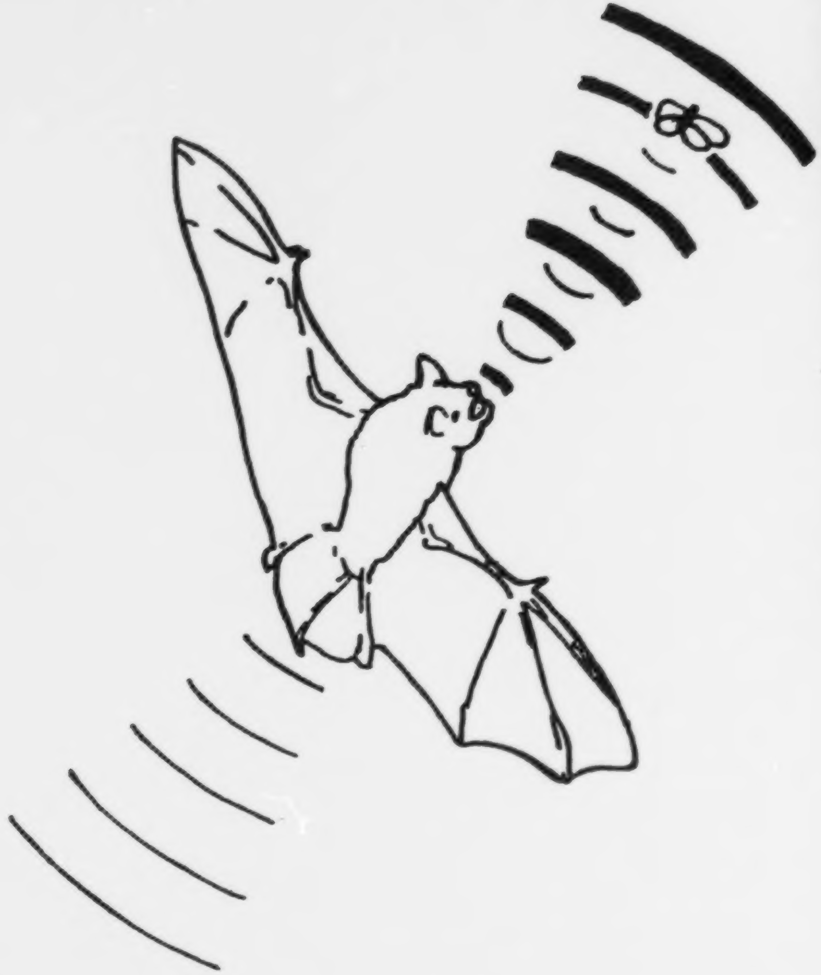

Figure 2: Bat Using Echolocation

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MOSQUITO SALMON BEAR

Focus	To teach food chain and predator/prey interrelationships.
Group Size	Entire class
Time Required	20 minutes
Materials	Objects to mark starting lines and home bases
Physical Setting	Level field/clearing
Process	1. Separate students into two teams. The teams decide in secret whether they will be mosquitoes, salmon, or bears. Just as in rock-paper-scissors, there is a hierarchy. Bears eat salmon, salmon eat mosquitoes, and mosquitoes eat bears. The teams need to have a first choice and a back-up choice. That way if the first choice of each team is the same they can go to the second choice without having to regroup. 2. The teams then line up along two parallel lines, spaced about ten feet apart, opposite a chosen opponent. When the moderator yells "one...two...prey!", students act the part of their chosen fauna (bears raise their arms and roar, mosquitoes point and buzz, and salmon wiggle their fins and snap their mouths), and either chase their prey or run from predators to their home base; ten feet behind the starting lines. If caught, players then become members of the opposing team.

MIX & MATCH

Focus	To use imagination in the study of animal specialization.
Group Size	Entire class
Time Required	1 hour
Materials	Markers/crayons Drawing paper Handout: ***Special Specializations***
Physical Setting	Standard classroom or trail clearing

Process

Activity 1: CREATURE FEATURES

1. Discuss the concept of animals becoming adapted to their habitats: The animals that have helpful characteristics tend to survive, have off-spring, and pass on those helpful traits to their young. These survival traits, or specializations, cover many different areas.

2. Have the students name some specializations first, guess what the specializations of the animals on the handout are, or guess what the specializations do for the animal.

Activity 2: BITS & PIECES

1. Using the information from the discussion, paper and markers/crayons, have the class design (singly or in small groups) their own ecosystem. They can use characteristics and food chains that are familiar, or go wild and make up their own.

2. Require them to name the type of habitat, a producer, primary consumer, and secondary consumer. The goal here is to emphasize that we have specializations for a reason. No feature is too strange--it simply needs to have a survival rationale behind it.

Debrief:

Have student(s) give a tour of their ecosystem.

Special Specializations

Animal		**Specialization**
Coloration:	fawn	spotted coat
	chameleon	skin pigment changes to match surroundings
	monarch butterflies	bright colors warn predators of bad taste/poison
Features:	bat	nose, ear and face are shaped to catch and send echolocation
	cat	whiskers for "night vision" and navigating in tight spaces
	pig	strong, prominent snout for rooting and smelling
Teeth:	guinea pig	long, flat, front teeth for cutting pieces of plant: flat, knobby teeth in back to grind it up
	leopard	long, sharp, front teeth for tearing meat; flat, sharp back teeth for cutting it up
	human	long, flat, front teeth; long, sharp, front teeth; flat, sharp back teeth; flat, knobby, back teeth
	woodpecker	strong beak and tongue to get into trees and reach insects
Eyes:	pigeon	large part of their life is spent avoiding predators, side-set eyes allow it to see in two directions at once
	wolf	front-set, small eyes allow it to see the prey it is following with its powerful and prominent nose
	monkey	binocular vision (just like binoculars), two circles of vision that overlap to give depth perception-- very handy if you're swinging through trees
Bodies:	kangaroo	big, long feet to bounce and fight with; big, long tail to balance the feet
	robin	hollow, light bones; feathers for flight and warmth
	trout	gills to take oxygen from the water; fins and strong tail to move in the water; scales that minimize water resistance and do well when wet
Seasonal:	snowshoe hare	brown coat in the summer, white coat in the winter
	black bear	slows down metabolism and hibernates in the winter, energy saving mechanism--lack of food in the winter
	Canada goose	migrates in the spring and fall to reach desired climate and food

PREDATOR-PREY

Focus To stimulate discussion about strategies and adaptations of both predator and prey using simulations and games.

Group Size 10-20 students (*larger groups should be broken down for some of the exercises*)

Time Required 40 minutes

Materials Two blindfolds

Physical Setting Braille Trail, Covell Creek Trail

Process

Activity One:

1. Begin by heightening the group's sense of hearing--both prey and predator need a good sense of hearing in order to survive. Have the group form a circle and place one blindfolded person in the middle of it. The people in the circle take turns clapping, while the person in the middle (the predator) tries to point to the person who is clapping (the prey).

2. The simulation can be taken a step further. Keep the group in a circle, but in the center there will be both predator and prey. Participants may want to pick specific prey and predator to simulate. Both will be blindfolded to simulate a night-time hunting situation, while the predator tries to catch his/her prey within the circle.

Discussion:

Discuss the different strategies used by both the prey and predator:

Did they hide?
Did they use camouflage?
Did they use speed?
How did they use their different senses?

Activity 2:

The last exercise is basically a type of hide-and-seek. It can get a bit rowdy, so it's best to play in a safe area with a smaller group of people. Take special care to set boundaries.

1. One person is the predator and must always be touching a specific tree or rock. The rest of the group are prey. When the predator shuts his or her eyes and counts to a given number (usually no more than ten) the prey will hide.

2. Once the count is over, the predator looks for the prey, while still touching her/his special tree or rock. If the predator sees any part of the prey he/she calls out their name and that person/prey has been eaten.

3. When the predator has seen everyone possible, she or he calls out "I've see all I can see", shuts his or her eyes and counts again for a shorter amount of time. During the count the prey must move closer to the predator, finding a new hiding spot. Continue this process until all the prey have been found.

Discussion:

1. Discuss the different adaptations that worked for the prey:
   What colors blended in best?
   How did the prey use their different sizes?

2. Look up information about local animals and study the special adaptations that have allowed them to survive.

TOOLS OF THE TRADE

Focus

To assist students in understanding the adaptation of birds to specific habitat.

Group Size

Entire class (*in groups of 10*)

Time Required

1 hour

Materials

Habitats:

a) cup filled with water and small rocks
b) tray filled with dirt and sunflower seed mix
c) tray filled with leaf and small birdseed mix
d) test tube filled with small bird seed and the opening covered with a piece of balsa wood
e) test tube filled with water and an empty test tube
f) tray filled with dirt and yarn pieces
g) block of wood

Beaks:	Feet:
Spoon	Tennis shoe
Hook	Thong
Pliers	Hook
Chopsticks	Swimming fin
Ice pick and Q-tip	Clothes pins on a stick
Eyedropper	

Bird guide with pictures/photos
Handout: ***Habitats and Tools (instructor's cheat sheet)***

Physical Setting

Near the bird blind, at a distance that won't disturb birds

Process

Activity 1:

1. Start the activity by asking the students what they think the word adaptation means. Ask them for examples of how people have adapted to their habitats, and how habitats have been adapted to meet people's needs (ie...clothing, building houses, industry).

2. Have the students pretend to lose the use of their thumbs and ask how they might have to adapt to this new situation. Discuss how many animals, such as birds, do not have the capacity to adapt as rapidly as we do to new situations and environments. Explain how birds behave instinctively to survive, and that they don't always have the same capacity that humans do to change their lifestyles to meet a rapid change in habitat.

3. Set out the different representatives of bird feet. Ask the students to figure out which shoe might represent each type of bird, and what specializations were incorporated to suit the birds to their habitat.

Activity 2:
1. Set out the different habitats and bird beak types. As with the feet, discuss the possible functions for the various beaks.

2. Based on the beak usage discussion, have each student (or group of students) select a beak and go to the habitat that they feel it is suited for. The student(s) should then try to "feed" for five minutes using the beak they have selected.

Feeding instructions:
a) the small stones must be removed, keeping as much water as possible in the cup (fishers)

b) seeds need to be picked out and crushed (seed eaters)

c) seeds need to be individually removed (insect eaters--ground)

d) piece of wood must be removed from the test tube so that the bird seed can be reached and individually removed (insect eaters --tree)

e) water needs to be removed from the full tube and placed in the empty tube (nectar eaters)

f) yarn pieces need to be individually removed from the dirt (insect eaters--marsh/dirt)

g) pieces of wood need to be removed/torn/gouged from the block (meat eaters)

3. After five minutes, see how well the students "ate" with their chosen utensils and discuss why or why not they were successful at feeding. Have the students select a different tool or habitat and try to feed for another five minutes.

Discussion:
1. Discuss the results from the feeding sessions and how the specializations of birds to their specific habitats would affect their success at adapting to a new or radically altered habitat.

2. Ask the students which type of birds they feel would be able to adapt and possibly survive in a different habitat? Which type of birds would have problems in adapting?

Activity 3:
Move on to observe at the bird blind. Have students try to identify the different types of birds, paying close attention to their beaks and feet and the way that they are used. Count the number of different species spotted.

Habitats and Tools

(instructors cheat sheet)

Birds, Beaks, and Habitats

a) Pelican *fisher/scooper*	•spoon •cup of H_2O and small rocks
b) Cardinal *seed eater*	•pliers •tray filled with dirt and sunflower seeds
c) Chickadee *insect eater--ground*	•chopsticks •tray filled with leaves and small bird seed
d) Woodpecker *insect eater--tree*	•ice pick and Q-tip •test tube filled with bird seed and covered with balsa wood
e) Robin *insect eater--marsh/dirt*	•tweezers •tray filled with dirt and yarn pieces
f) Hummingbird *nectar eater*	•eyedropper •test tube filled with water •empty test tube
g) Eagle *meat eater*	•hook •block of wood

Feet

Tennis shoe *grouse*	lives on the ground and spends a lot of time running
Thong *bittern*	shore bird that walks in the water and on the shore
Hook *hawk, eagle*	predator that uses feet for grasping and tearing
Fin *duck*	spends a lot of time swimming and paddling
Clothes pin on a stick *sparrow*	spends a lot of time perching on limbs

WEB OF LIFE

Focus To teach students the interrelationships of all living components of an ecosystem.

Group Size Entire class

Time Required 15 minutes

Materials 60' of string

Physical Setting Anywhere at Cispus, preferably in a small clearing on one of the trails.

Process 1. Students form a circle. Stand inside the circle near the edge, with the ball of string. Then begin asking: "Who can name a tree that grows in the Cispus area? ..Silver Fir...Good. Here, Miss Silver Fir, you hold the end of the string. Is there anything living around Cispus that might eat the Silver Fir? ..Wood ants...Great. Mr. Wood Ant you take hold of the string here; you are connected to Miss Silver Fir by your dependence on her for your lunch. Now who needs Mr. Termite for their lunch?"

2. Continue connecting the students with string as their relationships to the rest of the group emerge. Bring in new elements, such as other animals, soil, water and so on, until the entire circle of students is strung together in a "Web of Life". You have just created your own ecosystem.

3. To demonstrate how each individual is important to the whole community, take away, by some plausible means, one member of the web. For example, a fire or logger kills a tree. When the tree falls it tugs on the string that it's holding. Anyone who feels a tug on her or his string is in some way affected by the death of the tree. Now everyone who felt a tug from the tree gives a tug. The process continues until every individual is shown to be affected in some way by the destruction of the tree.

Discussion:
1. Have everyone describe how they were affected by the destruction of the tree. Were the affects on each organism equally important to their survival?

2. Discuss what might happen if:
-deer in the Cispus area were hunted
-the Cispus River flooded
-hikers picked most of the wildflowers
-a disease killed many of the woodpeckers

WELCOME TO OUR FOREST

Focus To become familiar with the animals and plants of the forest, and to understand the relationships between plants, animals and the forest. *This activity will be most effective with grades K-6*

Group Size Entire class

Time Required 30-60 minutes

Materials Felt board (*Forestry room*)
Felt pieces (*obtain from Cispus staff*)

Physical Setting Forestry room

Process 1. Students sit on the floor around the felt board (make sure the board is blank). Tell the students to close their eyes and imagine that they are in a forest. Have them visualize for about 5 minutes, then, open their eyes and share the images they imagined.

2. Tell them that they are going to visit a beautiful forest and meet a friendly bear named Fred (or whatever name you choose). Explain to the students that they must be quiet, so that Fred and his friends will come out to meet them. Bring out the felt bear and introduce him to the students. Put Fred on the board by himself and tell the students that he's lonely. Ask them to remember what they visualized when they thought about a forest and ask what they could add to the board to keep Fred company.

3. After the students have given some responses, spread the remaining felt pieces out, and ask for volunteers to come up and give Fred some forest friends. After the students have put the pieces they want on the board, ask them to sit quietly so that Fred and his friends will not be afraid. Now you can introduce the felt pieces and explain what each one does in the forest (ex: relationship between plants and the sun, how every living thing is dependent on the sun in some way, relationships between animals and plants).

4. When you're finished with your stories, tell them that Fred thanks them for being such nice visitors to his home!

Extension:
•Find stories about the forest and use the felt board to illustrate them.
•Make up your own story to use on the felt board.

WHAT WAS FOR LUNCH?

Focus To investigate a link of the food chain and discover the unique digestive traits of the owl.

Group Size Entire class

Time Required 1 hour

Materials
Dark construction paper
Rubber cement/glue
Tooth picks
Small water containers (*to moisten the pellets*)
Owl pellets (*can be found in barns and abandoned rural buildings, or ordered through science catalogues, check to see if Cispus has any available*)
available from Cispus staff:
Charts: varied thrush, mole, shrew, vole (*skeletons*); bone sorting chart; food web chart
Owl Pellet Kit (*teachers guide*)
The Barn Owl and the Pellet *by B. Gaussoin & J. Lapsansky*
Handout: ***How To Dissect Lunch***

Physical Setting Standard classroom with working space

Process

1. Introduce the activity by briefly reviewing the food-chain cycle. Discuss the owl's contribution in that process and present the details of the owl's digestive system.

2. Place students in groups of 4-7, so they can share their discoveries and questions with each other. Supply each group with an owl pellet, dark construction paper (the light colored bones will be easier to see), small water container, 2-3 toothpicks, and rubber cement.

3. As the groups dissect their pellet they may need to moisten it to loosen the bones from the fur of the regurgitated animal.

4. Make sure that the bone charts are placed where students can refer to them for bone identification. See if they can reconstruct a complete skeleton. Monitor the activity by encouraging student inquiries as well as interjecting questions requiring critical thinking skills.

5. When all bones have been extracted, students can adhere their new-found collection into a display

Discussion:
Lead a group discussion sharing the students' discoveries and unanswered questions.

How To Dissect Lunch

1. Inspect your pellet and note the size, bones, feathers, whitewash, or any clues about where it may have come from. ***You are a scientist.***

2. Gently pull apart the pellet, be very careful not to break any of the bones. You may want to add a few drops of water to soften up the fur. Carefully separate the bones from the fur or feathers, using the toothpicks. Be especially careful with the skulls and jaws, because they are the best way to identify an animal.

3. Look for evidence of the wool-eating moth in one of its life cycle phases: eggs, pupae casings, cocoons, or larvae.

4. Roll the last bits of fur between your fingers to find little bones or teeth that you may have overlooked.

5. Try to identify and reconstruct the skeletons of the animals you have found. How many animals were in your pellet?

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GOING BUGGY!

Focus To learn about identifying features and habitat of local aquatic insects.

Group Size Maximum of 20

Time Required 2 hours (*varies according to class size and depth of investigation*)

Materials

Collecting equipment
Per group:
Magnifying glasses
Collecting net/screen
White observation pans
Several glass viewing jars
Tweezers/forceps
Wet gear (*for group members collecting the specimens*)
Handout: ***Aquatic Insects of Yellowjacket Ponds*** *(available from Cispus staff)*

Per student:
Drawing journal

Class chart:
Sheet of butcher paper
Marking pens

Physical Setting Yellowjacket Ponds

Process

Activity 1: COLLECTING GUIDELINES

1. Before beginning, explain to the class that you will be in an area that is home to a variety of creatures and that you want them to be able to explore it while creating as little disturbance as possible. Brainstorm ways to collect and study insects while doing as little harm to them and their habitat as possible. Measures that should be included:
   a. Share specimens with other groups.
   b. Treat insects gently and release them as soon as possible.
   c. Have only one person from each group assigned to remove insects from their homes.
   d. Release insects into the same environment you found them in.

Activity 2: COLLECTING AND STUDYING

1. Explain techniques for collecting insects:
   a. Use collecting net or screen to carefully capture insects
   b. Place into water-filled observation pans or viewing jars using forceps
   c. Keep insects cool and release them as soon as you can

2. Divide the class into groups of 4-5 and equip each with collecting materials and an identification guide.

3. Have each group select a section of the ponds to explore (the Additional Information section in the insect guide gives some suggestions about where the most common aquatic insects can usually be found). There are a variety of responsiblities to choose from (collecting insects, writing and drawing data,

organizing collection equipment, looking for insects, taking care of captured insects) and all group members should be involved in the process.

4. When an insect is discovered, capture and observe it carefully (Be careful, some of them do bite!). The students should sketch in their journals or write notes about where the insect was found (on a plant, in the mud, on the water's surface, etc.) and what it looked like. Then, using the insect guide, identify it. If no identification is made, write and draw as many details as possible, release the insect, and try to identify the insect using a more detailed guide. Share insects as much as possible with the other groups.

5. Make a class chart showing what insects were discovered, where they were found, how many there were, and whether they were immatures or adults.

Discussion:

1. Where did you find most of the insects?

2. Were they in places you expected to find them?

3. What similarities are there among the insects that you found?

4. What differences did you find?

5. What other life would you expect to find in this stream?

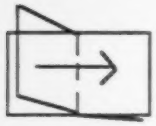
6. Pick one or two of the insects that your group found and describe the characteristics that make it suitable for its role in its environment.

7. Would you be likely to find the same specimens in a different aquatic invironment? Why or why not?

8. What were the most difficult things about identifying your specimens? Is there a classification system you think would be easier to use in identification?

9. Pick seven objects that are lying around you. They can be anything: sticks, rocks, sand, dirt, leaves, etc. Now, imagine that you have to show an alien, from a world that has few similarities ot our own, how to identify these objects. Use familiar identification systems or make up your own. When you've finished, tests out your identification system by having someone in your group pretend to be the alien and identify the objects you chose.

Assembly for *Aquatic Insects of Yellowjacket Ponds*:
1. Remove booklet from the curriculum guide; keeping the pages in the same order.
2. Fold the entire sheaf in half, forming a booklet



3. Staple securely down the middle.

A Different Perspective

esthetics, and the senses

BAT AND MOTH TAG

Focus To show the adaptations of the bat that aid it in catching food.

Group Size Entire class

Time Required 10-15 minutes

Materials Blindfolds (*1, or enough for entire class*)

Physical Setting Small clearing or opening along the trail

Process

1. One child is chosen to be the Bat and is blindfolded. The rest of the children are Moths and slowly walk around within the designated boundary.

2. To represent the echolocation used by bats to catch their prey, the child that is the Bat will periodically say "BAT". Every time the Bat says this all the moths will reply by saying "MOTH", representing the sound waves that will bounce off of the moths and return to the bat. The Bat tries to tag/eat as many moths as possible.

Variations:

- both moths and bat are blindfolded
- more than one bat

EACH ONE TEACH ONE

Focus To allow students to learn about the forest by teaching others.

Group Size Entire class

Time Required 45 minutes (*each station should last less than 2 minutes*)

Materials Taxonomy key

Physical Setting Trails at Cispus

Process 1. Gather the students into a semicircle. Then, select 1 or 2 students (depending on group size) and begin walking down the trail.

2. When arriving at any interesting object (you may wish to "preview" the trail), stop the student(s) and teach them something about it. A suggestion for a station is the ancient Douglas Fir tree on the Braille Trail. You might say to the student: *"This is an ancient Douglas Fir. You can tell that it is a Douglas Fir by its rough bark and by the cones lying beneath the canopy. It was a seedling at the time Christopher Columbus discovered America, and has survived two fires. One of the likely reasons it has survived the fires is because of its extremely thick bark."* The student(s) would gather this information, perhaps giving a trial run. It is important to remember to keep the information short and understandable.

3. Once the student(s) understand the station, other students pass by singly or in pairs. These students learn about the station and then continue down the trail to meet the instructor and learn about their station.

4. The next group goes through and is taught about the first and second stations, then moves on to become the third station. This process repeats until all the students have stations.

5. When the last student(s) have a station, the first station students will go to the second station to be taught, continuing until all students have been through every station.

Station suggestions:
•vegetation layers of the forest
•mushrooms
•millipede
•forest flowers
•banana slug
•bird call
•animal sign (spoor, owl pellet, hoof/paw print, tree markings)

Each One Teach One was introduced to the author by Wendy Scherrer of North Cascades Institute.

INTO THE NIGHT FOREST

Focus To rediscover and use all of our sensory abilities through guided inquiry and field study.

Group Size 15 students

Time Required 1.5 hours

Materials
One flashlight
Appropriate clothing
Darkness
Handout: ***Into the Night Forest questions***

Physical Setting Braille Trail and part of Covell Creek trail

Process

1. When it's dark, walk your students to where the Covell Creek trail and the Braille Trail end. Tell them you will take them into the forest where you hope they will rediscover and use all of their senses in a new way. Reassure them that they will be walking on a well established path that is extra wide, and that you know the path well. Tell them that they must stay together while they absorb their surroundings.

2. Before beginning ask: *"What precautions should be taken if you are going to walk in the forest at night?"* After several answers, again remind them of the safety of the adventure on which you are about to embark. Then ask: *"What are our senses?"* After the senses are identified, proceed at a leisurely pace up the wide path to Covell Creek. Remember to stop periodically. You may want to use the single flashlight once in a while.

3. You will lead the group. Place another adult/high school counselor at the end. Because this is a new experience for most of the students, be patient, and remind them to pay attention to the sounds and smells of the forest at night.

4. When you reach the creek, stop and calmly get everyone's attention. This is when they should begin to notice that there is more light near the creek. Ask them: *"Why is there more light in this part of the forest?"* After several responses, which should reflect changes in vegetation as related to soil changes and water availability, tell them: *"Now it's time to get re-acquainted with our senses. Pick up a handful of soil. Feel its texture by*

rubbing it slowly between your fingers and thumb. Bring your soil sample near your nose and slowly inhale its scent. Try to replace the soil in the same spot that you found it. Now, moisten your hands and rub them together. Carefully make your way to the nearest tree and feel its bark. What does is smell like? With your hands still damp, reach down and pick up a small rock. Are the edges sharp...smooth...rough? Feel the rock's texture. Carefully replace the rock in its original spot. Now we must be completely quiet and listen for the sound of this part of the forest (it will probably take some time to get them quiet). Quiet now (softly) "shhhhhh"...(wait at least a couple of minutes). What were some of the sounds you heard?

5. After several responses, begin turning them around to head back down the trail and return at a leisurely pace. Stop occasionally to again listen to the sounds of the forest. The sounds may be different than before.

6. At the end of the Covell Creek trail, take the trail that branches off to your left. This is the end of the Braille Trail, a special trail for the visually impaired. At night, we too are visually impaired. This gives us the opportunity to rediscover and use our other senses.

7. The next part of this activity can be done in a variety of ways. Place an adult at the end of the Braille Trail. Tell the group:
"I am going to place you by yourself several feet off of the path. Stand or sit, but you need to remain in the same spot. Become acquainted with your surroundings. Smell the air, the soil, the leaves, feel the plants and ground around you, and listen to the sounds of the forest in your special spot. MAKE NO SOUND YOURSELVES, PLEASE! Remain quiet. I will return to you in about 10 minutes."
Intentionally split up friends so they won't be inclined to visit. Intersperse adults and high school counselors at various intervals. Place students about 50-60 feet apart and show them where to sit with your flashlight. If a student is scared, place them near an adult or counselor. Place another adult at the end of the group. Then, circle around by going out onto the service road for the rental trailers and re-enter the Braille Trail where you began. Use your flashlight to assist everyone back to the path. Retrace your route, emphasizing quietness by being quiet and whispering yourself. Use the rope guide to follow the rest of the trail without the flashlight.

8. Upon returning to the center have the students complete the following worksheet.

Walk Into The Night Forest questions

WHAT precautions should be taken before taking a night hike?

LIST each of your senses. **NAME** at least one thing you discovered using each sense.
Example: SIGHT--tops of trees etched into the sky.

WHEN you entered the forest what senses could you rely on? **WHAT** senses became impaired?

WRITE a few sentences about your thoughts while alone in the forest.

HOW would a daytime visit be different?

HOW would this night-time visit be different in another season?

OWL GAMES

Focus To show the sensory adaptations of the owl that aid it in finding food.

Group Size 8-12 students

Time Required 10-20 minutes

Materials 1 blindfold

Physical Setting Any small clearing or opening along the trail, avoid roots and stumps

Process

Activity 1:

1. One child is selected to be the owl. He or she is blindfolded and placed in the middle of the clearing. The rest of the children (adults can play too!) make a circle around the owl.

2. One at a time, the people in the circle make random noises that an owl's prey would make (squeaking, chirping, rustling leaves, etc.). The owl then tries to point out who is making the noise. Rotate children so that everyone has a chance to be the owl.

Activity 2:

1. The group joins hands and forms a circle. One child is chosen to be the owl and is blindfolded, and another child is chosen to be the mouse. Both children then go to the center of the circle.

2. The owl will try to tag the mouse by listening to the sounds it makes while moving within the circle. During this time the circle remains silent and provides a boundary for the game. The mouse may try different techniques to keep from being caught, such as walking softly and crouching down. Rotate so that everyone gets a chance to be the owl or mouse at least once.

SENSORY BEAST

Focus To give the students an understanding of the sensory requirements of living in the natural environment.

Group Size Entire class

Time Required 15-30 minutes

Materials No extra materials required

Physical Setting Warm-up rounds can be played in the open, but the game is designed for play on the trail

Process

INTRODUCTION:

Begin with a brief discussion of sensory concepts.

1. Different animals rely more heavily upon different senses.
2. Humans are sensory generalists with our flat faces, flat ears, and mediocre sense of touch.
3. Animals are shaped so that their dominant sense is usually obvious:
    - -Dog's snouts stick out for smelling and grabbing with their teeth.
    - -Bat's ears and faces are shaped to catch and send echolocation signals.
    - -Bugs' antennae and feelers protrude from their bodies to sense the area around them.
    - -Cats' whiskers are like antennae for moving at night and in tight spaces.
4. Discuss some animals in the environment of the activity: deer, elk, chipmunk, squirrel, beaver, woodpecker, owl, etc.

HOW TO PLAY:

1. Work in teams of four. Two members will possess one sense, and the remaining two will have another sense (ex: two ears and two hands).
2. The team decides what form to arrange themselves in to make one creature. They move in this form through the game area.
3. Have them work together for 30 seconds to 1 minute to get accustomed to the form.
4. Have them switch roles and form to adapt to the environment.

OPTIONS:

1. Play a round with the creature inside of a circle of students, chasing a student who is their "prey".
2. Play at night or day. Each provides a good set of possible sensory experiences. Night is best for sight, sound, smell and touch. Day playing should eliminate sight as an option.

TOUCHY-FEELY

Focus

To allow students to utilize and focus on their sense of touch, and relate what they discover to the river and forest environments.

Group Size

Entire class

Time Required

1 hour

Materials

River ecosystem:	*Forest ecosystem:*
Aquatic plant	Fern frond
River rock	Upland rock
Sand and/or silt	Soil and/or humus
Driftwood	Rotting wood
	Conifer branch w/needles

8-12 wooden example boxes with hinged lids and shrouded hand holes *(students should be able to feel objects without being able to see them)*

Physical Setting

Standard classroom or clearing

Process

1. Students are introduced to the importance of tactile learning and the fact that we, as humans, often overlook this sense, thereby losing the incredible experience of how things in the environment around us feel.
2. Each box will contain a different single object from one of the two environments. The students will be aware that two environments are represented, though not their specific names or types. Students will line up and get a chance to feel the object inside each box. They should record their observations on a sheet of paper (***Discovery Journal***)--including the texture, temperature, hardness, softness, etc. of each object. Also they will make guesses about the object's identity, where it might be found in the local environment, and how it might relate to the other objects.
3. After everyone has passed through and finished recording, open the boxes and lay out the contents for everyone to see. Ask the students to help arrange them into two groups, according to the environment they belong to.

Discussion:

After the objects are laid out, discuss the recorded observations--ultimately linking the objects together according to their environment and encouraging the use of touch to gain information about one's surroundings.

Creative Spark

creativity and imagination

DISCOVERY JOURNAL

Focus	To encourage students to observe their surroundings and stimulate interest in what they see.
Group Size	Entire class
Time Required	20 minutes
Materials	*Per student:* Clipboard (*piece of cardboard or masonite & a bull-dog clip*) 3-ring Binder Pencil or Pen Journal Paper
Physical Setting	Wherever the student is
Process	1. Everyday the students will take the clipboard, a few sheets of paper, and a writing utensil along with them. 2. When the students find something interesting that they want to record, they can draw a picture and make some notes about it in their journal. If the student doesn't know much about the object, then he or she should be encouraged to research information and add what they learn to the notes already in their journal. The journal can also be used for any assignments they have. 3. At the end of the day, the students can color in their pictures using memory and journal notations. Then they can place the filled sheets in the 3-ring binder, and remove fresh sheets for the next day. 4. A variation would be to assign a focus each day for journal entries (insects, plants, birds, etc.), while also allowing them to add anything that interests them. Then, later in the day, time can be set aside for the students to research more information on the day's focus or whatever they want to learn more about.

Date:
Location:
Time:
Weather:
Details

Discovery Journal

____

name

EATING TOWER ROCK

Focus

To use a hike and dinner at Tower Rock Campground as a recreational, aesthetic and socialization process.

Group Size

Entire class

Time Required

3-3.5 hours

Materials

Flashlights
Van(*s*) for transporting materials
Wishboat materials (***see Once Upon A Wishboat***)
Instruments/props for campfire songs and skits

Fire:	*Dinner:*
Wood & kindling	Food & beverages
Matches	Serving utensils
Pail & shovel	Marshmallows
Water	Marshmallow skewers

Physical Setting

Along the road to Tower Rock Campground, Tower Rock Campground, Cispus River, and Cispus Education Building

Process

1. Everyone gathers at the flag pole to organize for the walk, while the van(s) pick up food at the dining hall.

2. Once assembled, begin the hike (single file) to Tower Rock Campground.

3. Once at Tower Rock Campground each classroom group will go to their table(s), set up their meals and have dinner.

4. After dinner has been cleared up and everything put into the van(s), the students, teachers and counselors construct their Wishboats from the materials they have brought with them (see ***ONCE UPON A WISHBOAT***). Be sure to take materials with you so that you don't strip the campground of natural materials. While waiting for it to become dark enough to launch the Wishboats, everyone could engage in rock-skipping along the Cispus River (see safety issues) or in other activities to occupy the time.

5. When it is dark, launch the Wishboats. Take advantage of the situation to roast marshmallows and sing songs around a campfire on the bank of the Cispus River. Watch the stars come out and have an impromptu astronomy lesson. See if you can identify constellations, or make up your own. If there are bats out, watch them catch insects and scoop drinks out of the Cispus River.

6. When it's time to return, hike back to camp using your flashlights.

FOOD:

A. You must arrange for the change in meal schedule with the main office and kitchen before you get to Cispus. A good selection for picnic food is:

Main course	*Side dish*	*Dessert*	*Beverage*
stew	rolls	cookies	milk
roast chicken	steamed veg.	apples	water
hamburgers	tater tots	marshmallows	fruit juice
	roast potatoes	canned fruit	
	sliced veggies		
	salad		

Remember condiments, plates, cups, silverware and napkins.

B. A van should be used to transport the food at about 3:00-3:30 p.m. It should take 30 minutes to walk down to Tower Rock Campground. If you begin loading the food as everyone is congregating at the flag pole, you will have about 45 minutes before they reach the campground.

C. You will find that the high school counselors will make good servers, which leaves the teacher/adult free to supervise the meal.

D. You need to gather the dishes, eating utensils, serving plates, and left-over food. This all needs to be taken back and the dishes washed up. Ask the cooks for directions.

HIKE:

The hike (1.25 miles one way) takes about 30 minutes. This can be an opportunity for viewing, discussing or participating in:

a) the origins of Tower Rock

b) the economy (jobs in the Cispus River valley)

c) rocks on the gravel bars of the Cispus River

d) visual and performing arts associated with the campfire and Wishboats

e) plant and animal sightings

SAFETY ISSUES:

There are several safety issues involved in this activity:

a) road safety during the hike (see ***1-2-3 Left-Right-Left***)

b) the procedure for skipping rocks on a river bank requires that all students stand in single file parallel to the river bank so that no one is throwing over any other person

c) students need to stay with their buddy and counselor to ensure that no one is lost.

FIRE UP YOUR CAMP LIFE

Focus To develop an esthetic appreciation for the natural environment through campfire activities.

Group Size Entire class

Time Required 1-2 hours

Materials Vary according to chosen skits and activities
Handout: ***How To Launch Your Campfire***

Physical Setting Campfire Pit or Pavillion

Process

Activity 1: GATHERING MATERIALS

The development of an airtight, smoothly flowing campfire must begin well in advance of the show-time date. Conscientious planning is required in order to keep the eager anticipation and attention flowing through your audience.

The first step is to gather, beg, borrow or steal as many activities as possible. Here are a few hints in finding resources:

1. Songbooks containing the old goodies that are familiar or easy to learn. You could contact other schools who utilize Cispus and ask for the loan of their songbook.

2. Libraries usually carry books on legends, skits, stunts, pranks, songs, and poetry with nature and friendship themes.

3. People who have attended summer camps tend to offer a variety of ideas that have remained in their memory over time. Don't be shy, pick their brains! Jot down any silly run-ons or skits that people have recalled from their camp experience, those are the best of all.

4. Try to contact other adults who have acted as camp counselors or directors. They usually have a wealth of knowledge.

5. Believe it or not, a lot of crazy spin-offs can be developed by watching shows like Saturday Night Live, Sesame Street, or just regular T.V. shows. Use your imagination.

6. See if you can begin a collection of crazy costumes and skit props. Things like bib overalls, police uniforms, toy guns, silly

hats of all varieties, flannel shirts, floppy coats, shoes, and wigs of all styles, etc.

7. Try to collect written compositions of student impressions, emotions and environmental views.

Activity 2: CAMPFIRE ORGANIZATION

1. The next step is to begin organizing the campfire songs and skits before your week at camp. If you wait until camp begins to organize skits and props you probably won't have enough time to produce the quality of program you want.

2. There are many methods of organization, here's one to consider:
Well in advance of camp week, ask each counselor to be in charge of 1 skit or run-on. If they have a group of kids that they'll be in charge of, it will be the counselors' responsibility to choreograph their chosen skit and assure that each child has a role to play in the campfire. This is an opportunity for the children to experience performing for an audience. The counselor will also be responsible for the costumes and props required for that particular skit. It's also a good idea to ask for written descriptions of the counselors' skits to make sure the lines and actions are appropriate. Sometimes skits can result in embarrassment if left unchecked. Kids love to see their teachers, parents, or other assisting adults up on stage, so if you can, try to schedule in a few "big kids" to liven up the atmosphere. Quick run-on's are great for the adults.

3. There are many, many familiar and easy-to-learn campfire songs to choose from. After you decide which songs you want to include, it's a good idea to make written copies for the campfire participants to read from. It's a much more enjoyable sing-a-long if everyone has the words right in front of them, instead of struggling to remember what the next line of the song is.

4. In order to produce an hour and a half campfire program, approximately 10-14 skits are required with intermittent songs and run-ons scattered throughout the schedule. Careful placement of active vs. more subtle activities provides the flowing continuity that makes a campfire successful. Remember, try to have a lot of ideas and spur-of-the-moment antics up your sleeve in case a lull suddenly arises in your program. The crazier and more creative YOU are, the better your program will be. Good luck!

How To Launch Your Campfire

The following schedule is a basic exmple of a campfire that should bring about a bit of laughter, groans, and maybe even a few tears. Typically, the pace of a campfire starts out active and full of vigor. Throughout the first half of the program, favorite songs and skits can be designed to keep audience participation high. As the night progresses, perhaps you'd like to change the campfire to a more soothing tone. Poems, quieter songs, Indian legends, or an oral reading of student-written environmental compositions tend to slow down the pace and elicit a more tender feeling within the campfire circle.

Below is a typical campfire schedule which could be duplicated and distributed to each counselor and adult involved in the program. Each of them is asked to prepare themselves quietly for their act or performance while the preceding activity on the schedule is taking place. This insures a smooth running program and eliminates empty spots in the entertainment. Empty space will usually make your audience restless. In addition to the sample schedule, examples of typical songs, run-ons, and skits are included for your reference.

CISPUS CAMPFIRE

1. SONG: *"If You're Happy and You Know It"*
2. SONG: *"Which Way America"*
3. SONG: *"This Land is Your Land"*

(Usually it helps to sing songs as the audience is being seated. This helps to keep a large group more orderly)

4. AUDIENCE PARTICIPATION SONG: *"My Aunt Came Back!"*
5. RUN-ON: *"It's All Around Me!"*

(A person runs around the campfire screaming, "It's all around me, it's all around me!" Another person asks, "What's all around you? Reply: "MY BELT!")

6. SKIT: *"The U.S.A. Spitting Team"*
7. SONG: *"Hecksacolamishawalkey"*
8. RUN-ON: *"The Infantry Is Coming!"*
9. TEACHERS SKIT: (Usually the teachers create a skit that's sure to make their students howl)
10. SONG: *"Spider's Web"*
11. SKIT: *"Is It Time Yet?"*
12. RUN-ON: *"How'd Ya Sleep?"*

("How'd ya sleep? Like a log! You would!")

(BEGIN TO SLOW DOWN THE PACE OF YOUR ACTIVITIES)

13. SONG: *"One Tin Soldier"*
14. POEM
15. AUDIENCE PARTICIPATION SONG: *"Making Rain"*
16. SONG: *"Leave Them A Flower"*
17. SKIT: *"Lost Chewing Gum"*
18. RUN-ON: *"Get Off My Back!"*

(Two people come in piggy-backing, the rider delivering insults to the carrier. Finally the carrier screams "Would you just get off my back!")

19. SONG: *"Where Have All The Flowers Gone?"*.

HI MOM, I'M AT CAMP!

Focus To use lecture and discussion in communicating home the joys of camp life.

Group Size Entire class

Time Required 30 minutes

Materials

Recycled stationary paper
Lined note paper
Writing utensils
Recycled paper envelopes
Stamps

Physical Setting In the group cabin

Process *This activity assumes previous instruction in the writing of a friendly letter, and that envelopes have been addressed before arriving at camp. In order to have the letter arrive home before the student, those students who spend 5 days here must mail their letter by Tuesday.*

1. Counselors will help the students to write a letter home on recycled stationary. Place lined paper underneath the stationery to provide lines to write on. The lined sheet may be used as a second page of the letter if needed.

2. Counselors hand out the pre-addressed envelopes and the letters are sealed and mailed.

LEAFY T'S

Focus To use natural objects in a creative activity.

Group Size 7-10 students

Time Required 45 minutes

Materials

Small sponge
Cardboard
Paper towels
Newspaper
Small foam paint brushes
Leaves (*all shapes and sizes*)
Textile/Latex paint (*variety of colors*)
Rolling pin (*8" length of 1/2" dowell works well*)
Water source or a bucket with sudsy water
White or light colored T-shirt (*washed to remove any sizing*)

Physical Setting Standard classroom with tables

Process

1. Choose flat leaves with interesting shapes and texture. Leaves should have some body to them. Limp or fragile ones won't print well. Lay out several thicknesses of newspaper to cushion your work surface. Cut cardboard pieces to fit inside the t-shirts. Insert cardboard between the front and back so that paint won't go through.

2. Dab the textile or latex paint on the underside of the leaves with a foam brush or a slightly damp sponge. Arrange the leaves carefully on the t-shirt, paint side down. Use more than one color on the leaves to get a mottled effect. Overlap leaves to create a collage effect.

3. Cover leaves with a paper towel. With the rolling pin or dowel, roll gently, but firmly over the surface several times.

4. Carefully lift off the paper towel and allow the t-shirt to dry for several hours or overnight.

ONCE UPON A WISHBOAT

Focus To provide a creative problem solving activity using natural materials.

Group Size Entire class

Time Required 30-60 minutes

Materials

- Mosses
- Flowers
- Twigs
- Rubber cement
- Leaves
- Plants
- Floatable bark pieces
- Birthday candles

Physical Setting Standard classroom or outside on picnic tables for assembly, at the Cispus River for launching

Process *Before constructing the wishboats, you may want to have the students think about some of their short term and/or long-term goals and what sort of things can help them to accomplish those goals. While they are building their wishboats they should also be constructing a personal wish that will help with their goals.*

1. Each student creates their own wishboat by selecting a piece of bark that will support the natural materials they decide to use to decorate their vessel.

2. After collecting various natural materials, the students will create a boat that will be suitable to send down the river carrying their private wish.

3. Each student will adhere a candle to their wishboat. This candle will symbolically carry their wish down the river. Adults light the candles. **If the fire danger is too high, light the candles, make a wish, blow out the candles, and then launch the wishboats**.

OUTDOOR INSPIRATION

Focus To show students how to use guided inquiry and discussion in expressing their feelings about nature or Cispus in a written form.

Group Size Entire class

Time Required 30-60 minutes

Materials
Paper
Pencils
Crayons
"Cascade Winter" 16mm film (*optional*)
Handout: ***Poem Templates***

Physical Setting Benched area on the Braille Trail

Process

1. Before going outside, introduce students to the poem forms. Give each student a copy of ***Poem Templates***. You may also want to show "Cascade Winter" to use as a take-off point for a poem.

2. Take the students to the area you have selected along the trail. Go slowly enough that they have time to absorb and appreciate their surroundings on the way there.

3. Once you have reached your destination, have students select individual writing places and, using the templates, create their poems. The objective is to use environmental or nature concepts as inspiration, but they should feel free to use anything that inspires them.

CINQUAIN:

A cinquain is an unrhymed Japanese poem which follows the pattern below:

1 word----noun, the subject of the poem, who or what the poem is about
2 words----adjectives, describing words, what size, color, etc, is the thing?
3 words----verbs, action words, what is the thing doing?
4-5 words----a phrase which shows how you feel about the subject
1 word----a synomym for the subject, another noun

HAIKU:

A haiku is an unrhymed Japanese poem about nature which follows the pattern below

line 1-----5 syllables
line 2-----7 syllables
line 3----- 5 syllables

Example:

The frost covered grass
Sparkles in the bright sunlight
The tree limb shivers

TANAKA:

A tanaka is an unrhymed Japanese poem about nature which follows the pattern below:

Line 1---5 syllables	The frost covered grass
Line 2---7 syllables	Sparkles in the bright sunlight
Line 3---5 syllables	The tree is jealous
Line 4---7 syllables	All of its leaves have fallen
Live 5---7 syllables	The bare limbs are shivering

DIAMANTE:

A diamante is a diamond shaped poem with an environmental theme and the following pattern:

noun
adjective, adjective
participle, participle, participle
noun, noun, noun, noun
participle, participle, participle
adjective, adjective
noun

Ex:

Pre-Cispusers
Fresh Blank
Shouting Arriving Singing
Boys Girls Teachers Counselors
Teaching Learning Hiking
Enriched Matured
Environmentalists

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THE THREE R GAME

Focus To learn the three components of waste reduction: Reduce, Re-use, and Recycle.

Group Size Entire class

Time Required 20 minutes

Materials

3 paper bags
Newspaper
Apple core
Plastic liter of pop
Box/bottle of cleaner
Spiral notebook paper
Bag of yard leaves
Aluminum cans
Mixed paper
Cereal box
Aluminum pop can
Bulk paper
Recycled toilet paper
Package of ramen
Tin cans
Cardboard
Bulk cereal
Baking soda box
Toilet paper
Glass food jars
Food scraps
Cup of ramen (with cup, plastic, and tagboard)
Watch with a second hand/stopwatch
Cardboard boxes/recycling bins
Handouts:
  Waste Not, Want Not
  Shopping Checklist

Physical Setting Standard classroom, or outside

Process *Before starting the game, discuss the ideas on the handout. This is a three-part game that can be played with three or six teams. The points won in each part of the game are added up to determine the winning team.*

Scoring: earn a point for every "smart" decision, subtract one for each wasteful or hazardous item

REDUCE:

This is a shopping game where items are set up on a table or bench. The contestants have a basic list of items to buy. The shopping is timed for 1 minute. Their choices are evaluated by the facilitator at the check-out, and points are given for the most environmentally conscious decisions.

Scoring: earn a point for every item re-used, subtract one for every item left over

RE-USE:

Set-up jars, food waste, yard waste, and paper used on one side. The students have 1 minute to find a way to re-use as many items as possible.

Scoring: earn a point for each correct item in a bin, subtract a point for each incorrect item

RECYCLE:

Set up recycling bins and recyclable materials on a table. The contestants have 30 seconds to put the materials into the correct bins.

Review:

1. How can you re-use yard waste and food scraps at home?

2. What items can you recycle at home?

3. Do you know what items your local recycling center will accept?

4. How can you get in touch with your local recycling center?

5. Where would you put a worm bin in your home? Who would take care of it?

6. What kind of products can you tell your parents to look for when they go shopping?

7. What products does your family use now that can be changed to reduce waste? Think about different brands, buying bulk, same brand--different package, do you need or use it, and hazardous by-products/leftovers.

Shopping Checklist

ask yourself these questions before you buy:

-Does it contain toxic ingredients?

-Can I buy a non-hazardous alternative?

-Is it made from recycled materials?

-Is the packaging recyclable?

-Can I re-use the container?

-Is it overpackaged?

-Can I buy it in bulk?

-Does it have more than one use?

-Can I buy a different brand?

-If it breaks, can it be repaired, or must it be replaced?

-Can I buy it second hand?

-Do I really need this?

Waste Not, Want Not

Due to an increase in population and the closure of many landfills, waste reduction is an essential part of what each of us can do to alleviate problems associated with the waste we produce. Here are some examples of what you can do to reduce and utilize the waste you create, and possibly save you money on your garbage rates!

REDUCE:
Outside of the home you can help reduce waste by making better buying decisions while shopping.

RE-USE:
Using a worm bin is also part of the solution. It's something that we can do at home to reduce the amount of waste we put out at the curb each week. The worm bin can swallow up much of our organic kitchen waste (no meat or animal fats), while producing rich soil for our house plants or gardens. Yard waste, like leaves and weeds, can be composted and used as fertilizer too.

RECYCLE:
At home you can recycle aluminum, paper, newspaper, glass and cardboard. In some places you can also recycle plastic, tin cans and mixed metal cans.

CAPTURE THE MOMENT; SEIZE THE PLACE

Focus

To use lecture, demonstration and guided practice in making observations of time and place.

Group Size

Entire class, then small groups, ending with individual observations

Time Required

1.5 hours

Materials

Medium size spiral notebook for each student, (*lined or unlined*),
Ball point pen
John Pitcher is a resident artist/naturalist at the Cispus Center. He can teach your group these methods and help get your group started in this fun activity. **YOU MUST MAKE ARRANGEMENTS WITH HIM SEVERAL WEEKS PRIOR TO YOUR ARRIVAL TO ENSURE HE'S AVAILABLE.**
Handouts:
  Field Journal Entry
  Student Journal Entry

Physical Setting

Standard classroom , then outdoors at three separate locations

Process

Activity 1: DEMONSTRATION

Mr. Pitcher will design a program to fit your needs. Meet John at the Cispus Center offices and he will escort your group to a classroom where he will display samples of scientific field journals he has made. He will then diagram on the chalkboard a handy format to follow to make expert field observations. He can show several styles and students can pick the one they like best. (SEE THE NEXT TWO PAGES FOR TWO SAMPLES)

Activity 2: WHOLE CLASS OBSERVATION

John will then take your group outside the classroom for some guided practice where the whole class will use the same setting on which to base their observations.

Activity 3: SMALL GROUP-LARGE VIEW OBSERVATION

Break your class into at least three groups--the smaller the better. Make sure there is an adult with each group.
Group 1: Walk this group out the main entrance and down the road to the right about 1/4 mile to the fire station. Stop here and make your first observation.

Group 2: Walk this group out the main entrance and up the Covell Creek trail until you are under the first group of vine maple trees hanging over the path. Stop here and make your first observation.

Group 3: Take the trail that begins near the Dispensary, cross the road carefully (some logging trucks don't slow down), and proceed on the path that goes though the middle of the trailer court. Cross the short grassy area and hike up the wider path to a point about 100 feet short of Covell Creek. At this point the vegetation begins to change; make your first observation here.

If you have more than 3 groups, choose other trails not too far from the other groups. Spend about 10 minutes observing and recording what is seen, felt, and heard. Encourage students to share and help each other.

Activity 3: A PRIVATE, PERSONAL PERSPECTIVE

Switch sites with one of the other groups. When you get to your observation point review orally with your group what shoud be included for a good observation. Encourage use of precise adjectives like, "The sound of my footsteps in the snow was 'crunchy' not 'squeaky'", or, "The clouds were white and puffy." SEPERATE THE STUDENTS FROM EACH OTHER AT THIS TIME. Have them record their observations privately, without talking for about 5 minutes. Allow students time to share and refine their data at the end of this period. Encourage them to record their feelings as part of their personal touch.

WHOLE CLASS OBSERVATION

Following Mr. Pitcher's lead, **record your observations** of the setting. Feel free to draw or sketch. Remember to use precise descriptive words. Be complete; don't leave anything out.

SMALL GROUP-LARGE VIEW OBSERVATION

Work with your group to develop a complete summary of data at this viewpoint. It's o.k. to copy each other. It's o.k. to disagree too. SAVE SOME SPACE TO MAKE A DRAWING IF YOU FEEL INSPIRED!

A PRIVATE, PERSONAL PERSPECTIVE

This is your opportunity to have a personal touch. You will see, feel, and hear different things from your friends. Take this time **BY YOURSELF** to record important information about this place. Remember to respect this private time of your friends, too; you can share later. Don't forget important elements of a scientific journal (the time, date, temperature, sky cover and color, variety of plants-trees, animals, birds, insects, noises, smells, tectures, and of course YOUR feelings.) Go ahead, draw something if you feel inspired.

THE FIELD JOURNAL

FIELD JOURNAL 1987

PITCHER, J.C.

28 SEP
7075°F
Blue sky - little wind.

MT. ADAM'S WILDERNESS - Killen Creek Trail / Pacific Crest Trail, WA

We left on a hike up Killen Creek at about 10:00 Am! Elk were heard bugling three times when we left. (Trail # 113 - 6008 elev.)

We started out in Bull Pine*/ Mountain Hemlock and as we ~~when~~ went higher it changed to sub-alpine Fir / Noble Fir / Mountain Hemlock. At the Killen Creek / Pacific Crest T. inter-section (about 6038 elv.) it was mainly sub-alpine Fir and White-bark Pine with scattered M. Hemlock. there were shrubs of Mountain Ash, and willows -

Birds observed:

- Mountain Chickadee - several flocks of 4-5 birds each group.
- Ⓟ Gray Jays - 8-10 birds in one flock begging for food from me while I photographed them.
- Red-Tailed Hawk 3 Imm. birds flying East.
- Dark-eyed Junco - common 40-50 birds
- Yellow-rumped Warbler - 1 fall ♀ (subsp.?)
- Townsend's Solitaire - 1 ad. (cont'd)

* Bull Pine = lodgepole Pine
Pinus contorta

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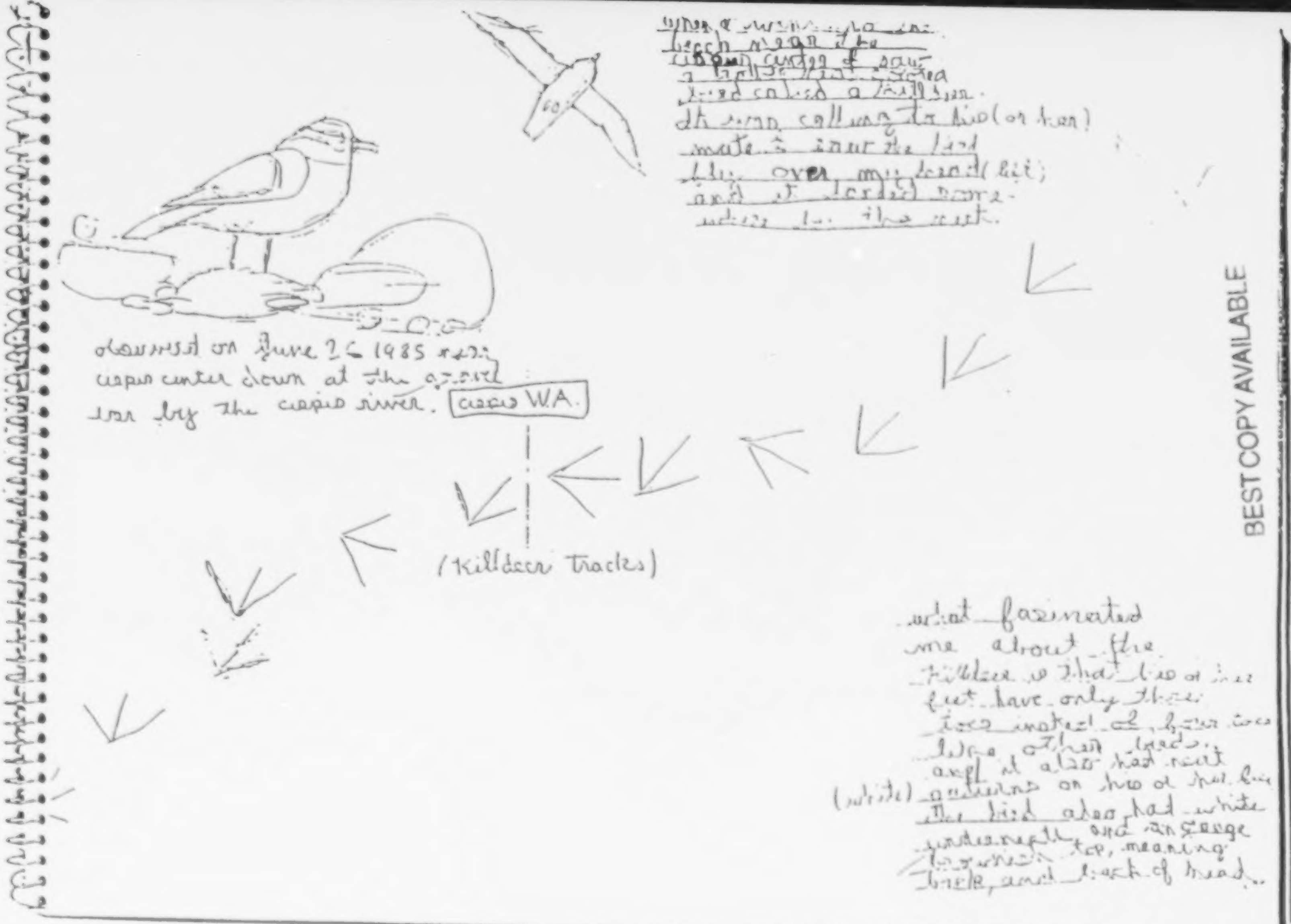

When I went [illegible] the
beach near the
[illegible] center I saw
a [illegible]
bird called a killdeer.
It was calling to his (or her)
mate & [illegible] the bird
fly over my head (hit);
and it landed some-
where in the east.

observed on June 26 1985 near
[illegible] center down at the [illegible]
[illegible] by the [illegible] river. [illegible] W.A.

what fasinated
me about the
killdeer is that his or her
feet have only three
toes instead of four toes
like other birds.
and it also had [illegible]
(white) [illegible] on his or her [illegible]
The bird also had white
underneath, and orange
[illegible] top, meaning
[illegible], and back of head.

(student drawing; age 10, 4th grade)

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DOWN MEMORY LANE

Focus To make an outdoor school autograph book and provide a final activity before departing.

Group Size Entire class

Time Required 30minutes, plus drying and assembly time as needed

Materials

Book construction:

Hole Punch
Yarn or twine
Stapler and staples
Paper fastners
9x12 construstion paper (*one piece per book, cut in half so that cover and back will measure 4.5x6 in.*)
White or colored duplicator paper (*5 or 6 pieces cut in half so that filler pages measure 4.25x5.5 in.*)

Cover Decorations:

India Ink, stiff toothbrushes, and spatter paint frames
Block printing ink and brayers (ink roller)
Pen and ink drawings of cabin logo, a Cispus site, Camp Critter, etc.
Artist/owner's name inside front cover with cabin group id.

Physical Setting Indoor or outdoor classroom area

Process

Activity 1: MAKING MEMORIES

1. Design the autograph book covers and allow for drying time.

2. Arrange the filler paper between the construction paper cover. Then fasten the book together using staples, or by punching holes along one edge and joining with twine or paper fasteners

3. COLLECT ALL BOOKS and save until...

Activity 2: MEMORABLE MOMENTS

On the last day of camp, after luggage is loaded, cabins and grounds are cleaned, and everything is done; return books to counselors for distribution to the students.

FIRE AWAY!

Focus To develop an esthetic appreciation for the natural environment through campfire activities.

Group Size Entire class

Time Required 1-2 hours

Materials Vary according to chosen skits and activities

Physical Setting Campfire Pit or Pavilion

Process

CAMPFIRE #1:

For a more enjoyable campfire, practice the songs and skits beforehand. Then, the participants can spend time actually enjoying the activities, instead of learning them and trying to make them work.

Introduction

This could be a request for a reflection on the day's activities. You might want to have the first song of the campfire to be played while everyone is being seated. Having the song played while everyone is being seated may serve to smooth the edges of the excitement that might be present.

Outline

1. Introductions and reflections on the day
2. Song: "Day-O"
3. Song: "Hey, Ho, Nobody Home"
4. Teacher's Skit: Finding a Dime
5. Audience Participation Song: "Boom Boom"
6. Skit: Roaming Naturalist
7. Skit: Sale of Cispus Wear
8. Skit: Guess What's Behind the Sleeping Bag!
9. Song: "Tie Me Kangaroo Down, Sport"
10. Skit: Allergies
11. Skit: The Bus
12. Audience Participation Song: "This Land is My Land"
13. Skit: Photographing the Audience
14. Short Story
15. Song: "Love is a Rose"
16. Skit: Looking for a Room
17. Poetry Reading
18. Song: "I'd Like to Teach the World to Sing"
19. Short Story
20. Song: "Dock of the Bay"
21. Goodnight!

CAMPFIRE #2:

Introduction

This could be a request for a reflection on the day's activities. You might want to have the first song of the campfire to be played while everyone is being seated. Having the song played while everyone is being seated may serve to smooth the edges of the excitement that might be present.

Outline:

1. Introduction
2. Audience participation song: "Oh, Suzanna"
3. Song: "La Bamba"
4. Teacher Skit: I'm Sorry
5. Song: "Everyday People"
6. Skit: The Post Office
7. Skit: Trick Or Treat
8. Skit: T.V. Zombies
9. Song: "Mamas, Don't Let Your Babies Grow Up to Be Cowboys"
10. Audience Participation Song: "If I Had A Hammer"
11. Skit: The Goldilocks Family
12. Skit: Mystery Drink
13. Skits: Restaurant Bits
14. Short Story: The Cats and the Monkey
15. Song: "Take Me Home, Country Roads"
16. Poetry Readings: *A Bird Came Down The Walk*- Emily Dickenson
    Seal Lullaby- Rudyard Kipling
17. Audience Participation Song: "Raindrops Keep Falling On My Head"
18. Short Story: The Donkey and the Little Dog
19. Song: "I Shall Be Released"
20. Good Night!

I'm sorry

Teacher's Skit

Having some of the teachers or group leaders perform in the first skit may help alleviate some of the anxiety sometimes felt by youngsters who are not familiar with getting up in front of a crowd and performing. But the role of 'sorry' itself may be played best by a younger person.

Players:
Nag 1:
Nag 2:
I.S.:

Props: a chair

The skit opens with a lone person sitting in a chair on stage. The two nags come in and start nagging the person sitting in the chair, one stands on either side of the person.

Nag #1: Hey! I thought I asked you to take out the garbage. What happened?

I.S.: Oh, well, I'm sorry.

Nag #2: Oh, yeah? Well I asked you to butter the rolls. Why didn't you do that?

I.S.: I'm sorry.

Nag #1: And I asked you to walk the dog. What happened to that?

I.S.: Oh, well, (shrugging shoulders) I'm sorry.

Nag #2: 'I'm sorry' he/she says, 'I'm sorry'! Well 'sorry' doesn't take out the garbage, 'sorry' doesn't butter the rolls, 'sorry' doesn't walk the dog, 'sorry' doesn't get anything done.

Nag #1: What's your name anyway?

I.S. I told you my name. I'm sorry. And I don't do anything! (runs off-stage)

Nag #2: And boy are we sorry. Now we have to do all of those things.

End

The Post Office

Players:

Manager:
Customer 1:
Customer 2:
Customer 3:
Customer 4:

New Worker 1:
New Worker 2:
New Worker 3:
New Worker 4:

Postal Worker 1:
Postal Worker 2:

Props: scrap paper for letters
small table for post office window

The setting of this skit is in a post office. There is one extra postal worker mentioned in the 'persons of the skit' who does not have a speaking role. This person will be the person that the new workers are supposed to hand the incoming letters to. The manager in the post office is obviously frustrated, for the manager is having a difficult time managing her/his employees.

Manager: (looking and sounding exhausted) Boy, working at this post office is really getting to me. It's so hard to find good help these days.

Post Office Worker: Oh Mr.Manager? The new employee has come in.

Manager: Send him in!

New Guy #1: (approaching manager) Hi. I am the new guy.

Manager: O.K. Here's what you must do. People come up to the window, where you'll be standing, and they will want to mail things. All you must do is take what ever it is that they want to mail, and give it to the person behind you. Understand?

NG1: Sounds simple enough. (takes his place by the imaginary postal window)

Customer approaches NG1 with a letter or piece of paper or something like that.

Customer 1: Hello.

NG1: Hiya.

C1: I'd like to send this letter to New Orleans.

NG1: Gee, that's nice. Why do you want to do that?

C1: Because my friend lives down there and I want to send him this letter.

NG1: What's your friend's name?

C1: Oh, his name is Boom-Boom.

NG1: My, what a silly name. Well, good luck sending your letter.

C1: Wait a second! Aren't you going to take my letter.

NG1: Naa-aaaah! (with an exaggerated hand gesture,as though pushing something slowly away from yourself) Why would I wanna do something like that?, for crying out loud.

Manager: (overhearing the last few lines, then aproaching NG1 and saying to him) Hey, you're no good! You're fired! Get lost!

NG1 exits

Manager: Here, I'll take the letter for you. (Takes the letter from C1) Have a nice day.

C1 exits

Post office worker: Oh, Mr. Manager?

Manager: Yes?

Post office worker: The other new person has just arrived. Should I send her/him in?

Manager: Yes.

New Person #2: I am the new person.

Manager: Great. Now all you have to do is stand at this window, and when someone comes in to mail something, you take whatever it is from them and hand it to the person over there. Then you can say, "Have a nice day".
Understand?

NP2: Yes, I understand.

Manager: O.K., now get to work.

Manager steps away
Customer with letter approaches NP2

Customer 2: Hello.

NP2: Hi.

Customer 2: I want to send this letter to Washington, D.C.

NP2: Well, what do you want me to do about it?

C2: What?! (outraged tone of voice) You are the post office person. You are supposed to help me send my mail!

NP2: Hey, calm down. Now just because you're too lazy to take it there yourself doesn't mean you should come in here and yell at me like I'm a misbehaving circus freak. Now beat it before I tell Jumbo the elephant to sit on you.

Manager: (overhearing and approaching NP2) Holy Toledo! You're fired! Get outta here!

NP2 exits

Manager: (to C2) I'll take that letter for you, turtle dove. Have a nice day.

Manager takes the letter and C2 exits.

Post Office Worker: Oh Mr. Manager?

Manager: What?

Post Office Worker: The new person is here. Should I send them in?

Manager: Yes.

Postal worker exits, NP3 enters

Manager: O.K. Here is all you have to do. You stand at this window, and when a customer comes in, you take what ever it is that they have, and you give it to the person over there. (gesturing to the other postal worker) Then you say, 'Have a nice day'. Understand?

NP3: Yes.

Manager leaves NP3, but stays relatively close to watch for any slip ups. NP3 takes their place at the window, and customer # 3 approaches the window with a letter.

NP3: Hi.

C3: Hi. I'd like to send this letter to Brazil.

NP3: O.K. (taking the letter) That will be one dollar.

C3: O.K. Here you are. (hands over the imaginary money)

NP3: Have a nice day!

Manager: (obviously pleased and applauding) Hey, all right! Way to go!

NP3 takes the letter and tears it into pieces.

Manager: Hey, what are you doing?

NP3: Well, I've never liked Brazil, and I don't think the people down there deserve any mail.

Manager: You're fired.

NP3 exits

Postal Worker: Oh Mr. Manager?

Manager: Send them in.

NP 4 enters

NP4: Hi.

Manager: Do you like Brazil?

NP4: I love Brazil.

Manager: O.K., you're hired. Now, all you have to do is stand at that window over there, and when a customer comes in with something to mail, you take it from them and give it to the person over there (gestering towards the other postal worker). Then you can say, 'Have a nice day'. Understand?

NP4: Yes.

Manager: O.K. Go to work.

NP4 takes place at the window. Customer 4 aproaches, Manager looks on anxiously.

NP4: Hi.

C4: Hi. I want to sent this letter to New York.

NP4: No you don't.

Manager observing and groaning, placing hands over his eyes.

C4: What?

NP4: You don't want to send that to New York.

C4: Yes, I do.

NP4: No you don't. You're lying.

C4: Now see here---

Manager: (running to them) That does it! Everyone is fired, and I quit! Everyone go home.

End

Trick or Treat

Players
Sally:
Henry:
Joe:
Mary:
Trick-or-Treater 1:
Trick-or-Treater 2:
Trick-or-Treater 3:
Trick-or-Treater 4:
Police Officer 1:
Police Officer 2:

Props: 4 chairs
2 trick-or-treat masks
2 trick-or-treat bags
cardboard box (radio)

4 people are seated in an assumed living room, listening to the radio. There is a knock on the door.

The Two Trick or Treaters: Knock Knock Knock.

Henry: Hey. I think that there's someone at the door.

Mary: Oh, I'll get it.

Mary approaches the imaginary door and opens it.

Mary: Yes?

The Two treat or Treaters: Trick or treat, trick or treat!

Mary: Oh my, it's two trick or treaters!

Henry: (rising from his chair) But it's not Halloween. (He approaches the door) Hey you kids, it's not Halloween.

2TT'ers: Trick or treat, trick or treat!

Henry: Hey you kids, it's not Halloween, so get lost.

T1: We're not leaving until you give us some treats.

T2: Yeah, so hand over the goods Pops!

Henry: Oh yeah? (becoming angry) We'll see about that.

Mary: Oh Henry, they look so cute. Let's give them something.

Joe: Yeah Henry! Give the kids some treats.

Henry: Oh, all right. (Handing over some treats, real or imaginary) Here you go, and Merry Christmas, or whatever day you think it is there.

Henry closes the imaginary door, the 2 TT'ers leave.

Joe: That was nice of Henry, wasn't it Sally?

Sally: Yes, it was very nice of Henry, wasn't it Mary?

Mary: Yes, it was very nice of Henry, wasn't it Henry?

Joe: Yes,it was Henry.

Two different trick or treaters arrive at the door. Perhaps the difference between these two TT'ers and the previous two could be an obvious size difference. To conserve resources, it may be best to use the same masks.

2TT'ers: Knock Knock Knock!

Joe: I'll get the door everybody. (Joe opens the door)

2TT'ers: Trick or treat, trick or treat!

Joe: Hey, two more trick or treaters.

Sally: Well tell them to go away, dag-nab it!

TT1: We're not leaving until we get our treats.

TT2: Yeah, so get with the program and break out the candy, Daddy-o!

Mary: Oh, give them some treats, Joe.

Henry: For Pete's sake, what's going on around here?

Joe hands over some treats, real or imaginary. The 2TT'ers exit.

Sally: Hey, it getting boring around here. Turn on the radio and liven the place up a bit.

Henry goes over and 'turns' the radio on. Immediately a news flash comes on. Someone in a secluded place can read the part of the radio announcer off of a card or something. Be certain a loud voice is used so all the audience can hear the news flash.

Radio announcer: Flash! There has been reports of two strange and unusual beings roaming about the area of the Cispus Learning Center. It is suspected that these beings are from outer space, and are thought to be very dangerous.

Joe: Gee, I wonder if those trick or treaters have anything to do with this.

Radio Announcer: These space people have been reported to be able to take on any form or shape that they like. It has also been reported that they are gathering treats of different types for their own diabolical purposes.

Joe: Oh, no, what'll we do?

Sally: Hey, Joe, just sit down and chill out.

Mary: Oh, no, what'll we do?

Henry: I've got an idea. I'll go outside and hide in the woods somewhere. When they come back, I'll come out and catch them and then you guys can call up the cops.

Sally: O.K., Henry, see you later.

Joe: Yeah, it's been nice knowing you!

Henry opens the door and goes outside. He closes the door and leaves the stage area. The three others gather by the 'window' and watch what goes on outside. By describing to each other what they see, the audience will learn what is actually going on outside.

Mary: Look, there goes Henry behind that tree.

Joe: I hope he makes it back all right.

Sally: Hey, I see two people walking around out there. They look like Police men.

Joe: Look, Henry is jumping out at them.

Voices are heard from the area where Henry disappeared to.
Policeman 1: Hey, it's one of those space people!

Policeman 2: Well put the cuffs on him, let's bring him in!

Joe: (turning from the window) Well, there goes Henry.

Sally: We should all at least say goodbye.

All: (waving at the imaginary window)
Goodbye, Henry, Goodbye!
Goodbye, Henry, Goodbye!

End

T.V. Zombies

Players

the Kid:
parental figure:
the other one:
8-10 zombies:

Props: chair
t.v. (box)
t.v. costume (see explaination below).

One costume is essential for this skit, and it is one that can be made quite simply. The costume of a T.V. set is needed. To make this costume, all that is needed is a big sheet of paper, or several little ones taped together, or just one piece of paper, with a television set drawn on it. A long string should be fastened to the paper that will enable the Kid to wear the costume around his or her neck when the time is appropriate. Perhaps 'the other one' could be given a long tree limb or something similar to act as a staff of some type.

The skit opens with one person , the Kid, sitting on a chair watching a television set, which is simply a cardboard box or a milk crate.

T.V. voice:(someone reading off of a card off-stage) And stay tuned, because you are a television viewer and you are worth money to us.

Parental Figure: (entering and looking at the the person watching T.V., an assumed child or something of theirs) You're still watching T.V.?! You've been doing that for hours!

Kid: I like watching T.V.

PF: You're going to turn into a T.V. zombie.

Kid: I don't care. All I want to do is watch T.V. I love it. I wish I could be a T.V. Then I could just look into a mirror at myself all day.

PF: Oh, no you don't. Then T.V. zombies just like you would all want to watch you.

Kid: Good. Then I would have lots of friends.

PF: Well, be careful of what you wish for. You might get it. (exits)

Kid: I don't care. I wish I was a T.V., I wish I was a T.V., (growing softer and slowly falling asleep in the chair) I wish I was a T.V. A T.V. A T.V. (mumbling and growing more quiet) a t.v.....

At this point the lights are shut off and the Kid is given the opportunity to put on the T.V. costume. The chair and the t.v. are removed. The lights are turned back on. The Kid stands next to the other one.

Kid: Where am I?

The other one: Welcome to Dreamland kid. Where all dreams come true.

Kid: (looking down) Hey! I am a T.V.

The other one: Yes, but too bad for you that there are no electrical outlets in Dreamland. You cannot plug yourself in.

Kid: Well what will I watch?

The other one: Ha-ha. I don't know. Perhaps you could watch the T.V. zombies walking around. (waving arms in the air)

Enter the T.V. zombies. Have about 8 or 10 group members begin to walk around like Frankenstein, with their faces emotionless and their arms outstreched and their knees locked. They are all moaning. They can all walk around in random routes mumbling the word 'T.V.'.

The other one: Well, good-bye kid! Ha-ha. And good luck with the zombies! Ha-ha-ha.

Kid: No! Don't leave me here! Help. Please!

The other one leaves, laughing loudly as the exit is made.

While the Kid is calling for help, the zombies notice him and that he is a television set. They slowly circle around him and start grabbing him. He runs away from them in random directions, but they continue to walk after them. None of them ever leave the stage, though.

Kid: (finally turning to them and confronting them) Hey. There's more to life than watching T.V.

A zombie: (groaning yet audible) What channel is that on?

Kid: No, let's be serious. You could all be walking in the woods or riding bicycles or reading books...

The zombies begin chanting the word 'T.V.' while the Kid is trying to convince them that there are other things to do. The lights are turned off, the zombies disappear, the chair and the T.V. are replaced, and The Kid, after the lights are turned back on, is sleeping in the chair, and wakes up screaming.

The Kid: (screaming yet sleeping) ...no! There are lots of other things to do. You could learn to play the tuba, or...

Partental Figure enters
Parental Figure: Hey, Hey! (shaking the Kid awake) Wake up! You're having a nightmare.

The Kid: (waking) Wow! What a terrible dream.

Parental Unit: What did you dream of?

The Kid: I dreamt I turned into a T.V., and all these T.V. zombies wanted to watch me, but I couldn't plug myself in.

Paretnal Figure: That's interesting. Did you learn anything from the dream?

The Kid: You bet! I learned that I want to write skits for Television. Since I can imagine such great things in my sleep, who knows what I can think of if I really try to make skits out of it.

End

CT-36

The Goldilocks Family

Players:

Mama:
Papa:
Baby:
Traveller 1:
Traveller 2:
Narrator:

Props:

3 soup bowls
three chairs
one table
three spoons
one big serving bowl

This skit is a take-off of the old fairy tale, "Goldilocks and the Three Bears".

The Goldilocks family is just sitting down for supper. Have the things set up to make it seem like dinner is about to be served. The narrator can be in a secluded are or standing on the side of the stage.

Narrator: Once upon a time there was a family. This family was known in certain circles as the Goldilocks family. This family consisted of a Mama Goldilocks, a Papa Goldilocks and a Baby Goldilocks. Despite feeling miserable most of the time, they did enjoy each other's company at meal time.

The Goldilocks family enters. Mama Goldilocks begins tell all to sit down while she brings over the big bowl of soup.

Mama: Now everyone sit down while I bring the soup.

Papa and Baby sit down with unhappy looks on their faces. Mama brings over the big bowl and pours the imaginary soup into the other bowls for her family.

Papa: (tasting the soup and making a fuss) Holy Cow! This soup is like molton lava! I think it is molten lava.

Baby: Molten lava? Ewww-www! I hate molten lava.

Mama: Well it's not molten lava. Who told you to go ahead and eat it anyway? Why don't you wait until it cools off instead of burning your mouths like a couple of dog-gone fools.

Narrator: And so it was mealtime as usual at the Goldilock's house. The soup was entirely too hot for the family to eat the soup, so they all had a discussion as to what should be done.

Papa: Mama, you usually cook something rotten for us, but this time you have outdone yourself. This is the worst thing I have ever tried to eat.

Baby: Yeah, I'm with Papa. I think I'm going to run away and join the circus. I can eat hay with the elephants.

Mama: Oh yeah? (shaking her fist at them) Well you two better run away before I give you a knuckle sandwich to eat.

Papa: Holy cow! (rising from the table with Baby) Let's get out of here Baby before Mama gets really mad!

Mama chases Papa and Baby out of the 'house' and they all run off stage.

Narrator: So the Goldilocks family decided to take a walk in the woods, so to allow for time for the soup to cool off. Meanwhile, two people were coming down the road towards the Goldilocks house. Their car had run out of gas a few miles away. They were hot and tired, and hungry too. They came to the Goldilocks house looking for a phone with which they could call for help.

The two people approach the Goldilocks house, and go to the 'door' and knock on it.

Traveller 1: Do you think anyone is home in this house?

Traveller 2: Gee, I hope so. I would hate to have to walk any farther.

They knock

T1 and T2: Knock knock knock!

T2: No one is home.

T1: Let's check and see if the door is locked.

T2 opens the 'door'.

T2: It's not! Let's go in.

Narrator: The two travellers rudely let themselves into the Goldilocks house, for it is bad manners to simply walk into a strangers house uninvited, unless it is an emergency. Let this be a lesson to all to lock their doors so hoodlems like these two don't come into your houses.

T1: (looking up towards the sky if the narrator is in a secluded place, or at the narrator if the narrator is on the side of the stage) Hoodlems??!

Brief pause

Narrator: The two came across Mama Goldilocks's soup.

T1: (looking at the table) Hey, look at this nice soup.

T2: MMMMM. Let's eat!

The two sit down and begin eating.

T1: (jumping up and making ugly faces) Yuch! This stuff tastes like gasoline.

T2: Yeah. (thinking) Hey, maybe we can use it to make our truck go.

T1: Hey, Yeah. Let's go.

The two pour all of the soup out of the bowls and put them in the one big bowl. THen they take the big bowl with them as they exit. Afterwards, the Goldilockses return.

Narrator: So the travellers took all the soup and left no soup for the hungry family.

The family walks in.

Baby: My legs hurt and I've got lots of mosquito bites.

Papa: You should have rubbed Mama's soup on yourself before we left. I bet the mosquitoes wouldn't have bit you then.

All three go to the table and look at their soup.

Baby: Hey, someone's been eating my soup.

Papa: Hey, someone's been eating my soup.

Mama: Well someone took our big bowl of soup. Now we can't eat it.

Papa and Baby: Hooray!

Narrator: So the family was very sad, because they had no supper. Just then, the travellers returned.

The travellers run up to the door.

T1and 2: Knock Knock Knock.

Mama: (answering the door) Yeah?

T1: Hey lady? We're the ones who stole your soup.

Mama: (angrily) Oh Yeah!

T2: Don't get mad. Your soup works just like gasoline, without all of the pollution.

T1: It's a better alternative to gasoline. You're gonna be a millionare after you sell the recipe.

Mama: Hooray!

End

Mystery Drink

Players

Game show host
Sam
Sally
Morticia (or Mort)
Painter:
Announcer 1:
Announcer 2:
Announcer 3:
Assistant:
Stage Hand:

Props:

3 empty glasses or cups
3 chairs
Applause card
empty pitcher
table for the three contestants to sit at
painter costume

This skit will need three empty cups, or as many cups as there will be participants in the skit. The skit is set up much like a game show as seen on television. The three participants will make an attempt to determine what it is they are actually drinking. An empty jug or pitcher can be used as the container in which the mystery drink is contained, hopefully one that is not transparent, so as to not expose the fact that it is empty. The players can make believe that there is liquid inside the pitcher. Perhaps the children involved could draw a large question mark on a piece of paper and tape it to the jug, and set the jug near their seats that will hopefully be on the stage by the time the skit begins. The question mark should face the audience, of course, so that the audience knows that the pitcher does indeed hold the mystery drink.

All of the roles can be played by either a male or female. It does not really matter. But to lessen the burden on the typist, only one of gender will be represented in the names and personal pronouns used in this skit. These names and personal pronouns can be changed to suit those of a different gender, or a horse of a different color.

There are several places where it is asked that applause be inspired. Perhaps someone, maybe one of the teachers, can begin applauding at those moments and inspire the others in the audience to do the same. Or, like a real game show, you could have a "stage hand" hold up an "APPLAUSE!" card at the appropriate moments.The skit will be much more fun if the audience does take this active role in the production.

The announcers and the game show host can be given cards, just like on televised game shows, with their lines on them. This way, they need not memorize their lines, they can simply refer to their cards.

Announcer #1: Get ready everybody, for now it's time for our favorite show, 'The Mystery Drink', with our favorite host, (ordinary name).

Game Show Host: Hello everyone, and welcome to our show. Tonight we have some interesting guests, I don't want to say they're unusual but, boy, they sure do *smell* unusual, let me tell you that! But that's O.K., cause it takes all kinds of different people to make the world what it is, right? All right! Let's get to know them right now. Shelly?

Announcer 2: O.K., Joe. Our first contestant is named Sally, and she is from San Francisco. Let's have a big round of applause for Sally from San Fransisco.

Inspire applause

GSH: Hi Sally. What possessed you to come up to this neck of the woods?

Sally: If I only knew....

Announcer 1: O.K. Joe. Our next contestant is named Sam. Sam from San Fransisco. Let's have a big round of applause for Sam from San Fransisco.

Inspire applause

GSH: Hey Sam, you're from San Fransisco too, huh?

Sam: Yeah, I guess that's what they call it. It's that city with that Gately Golden Bridge and everything? It's like, O.K., you go down Route 5 there, and then you turn...right, no left...no wait, you go straight ahead...

GSH: Oh Sam? We don't want directions to San Fransisco, but thanks anyway. Who's our third contestant?

Announcer #2: O.K., Joe. Our third guest is from that thriving metropolis known as Morton, Washington, where they've got a number of street lights and everything. Let's have a big round of applause for Morticia (or Mort) from Morton.

Inspire applause

GSH: O.K.,O.K. Now, before we get started, let's hear from one of our announcers about what our contestants will be competing for today.

Announcer #3: O.K., Joe. Today's contestants will be playing for a used, 1971 Volkswagon Beetle. The Volkswagon Beetle is complete with a rusted out floor, a broken rear-view mirror, a busted emergency brake cable, and it doesn't run any more either. Whatta heap!

Inspire applause

GSH: Wonderful, wonderful! Let's get down to the game. Let's have one of our assistants come out and fill everyone's cup up.

An assistant comes out and fills the cups with the imaginary liquid, giving all three a helping.

GSH: O.K. Now, let's everyone take a sip and then tell me what you think.

They all take a sip.

Sally: (looking disgusted) I think you are trying to poison us.

GSH: Oh, don't be such a spoiled sport. Contestant # 2, what do you think is the mystery drink?

Sam: Well, it's smooth and creamy. (Looking into the cup) It's white. I don't know, maybe it's some kind of milkshake or something.

GSH: O.K. Contestant # 3, what do you think the mystery drink is.

Mort: I don't know. It is smooth and creamy, and it is white. I guess I think it's a milkshake too.

GSH: O.K. Let's find out what actually is the mystery drink.

At this moment, another player comes in. He or she is a painter, a fact made obvious by the paintbrushes in their pockets and paint stained clothing. The painter comes over to where the mystery drink jug is.

The Painter: Hey, here's my paint! I've been looking all over for this. (The painter picks up the pitcher and walks off with it.)

GSH: Hey, it was paint! How about that. Well, that's all the time we have for today. See you next time on 'The Mystery Drink'.

End

Restaurant Bits

Players (for each bit): Waitress or waiter and customer

Props:	chairs and tables for customers menu order pad	soup bowl

These short skits will feature the dialogue between a waitress or waiter and a customer at this particular restaurant. Each of these skits will begin with the customer seated at a table of the restaurant and the waiter or waitress hustling by, finally stopping to answer the question the customer has been eagerly waiting to ask. One suggested set-up is to have two tables with two customers at each table set along the edge of the stage.

First Bite

Customer: (holding finger up in the air and calling either 'waiter' or 'waitress') Oh, waitress?!

W: (hustling by the table) Just one moment please!

C: Boy, I sure can't wait too long for this lunch. (seeing the waitress) Oh, Waitress!

W: (hustling by) Be so kind as to keep your shirt on, for I will be right with you.

Waitress continues on to area off stage somewhere, then comes back to take the order.

W: O.K. (taking notepad out) What will it be?

C: (looking at the menu) Oh, I think I will have the potatoes today..

W: O.K. We might be out of them, let me go and check.

The W. leaves and comes back.

W: I am sorry, we are out of the potates. The cook told me that the potatoe truck broke down on the way here. No potatoes.

C: O.K., let me have the beans then.

W: The beans?

C: Yes, I would like to have the beans.

W: O.K., I will check to see if we have the beans.

The W. leaves and comes back.

W: I am sorry, you cannot have the beans.

C: And why not?

W: Because one of our dishwashers spilled soapy water on them accidentally, and now the beans are all full of soap.

C: O.K., then, I think I will have the broiled vegetables.

W: Broiled vegetables?

C: Yes, bring me some broiled vegetables please.

W: O.K. I will check if we can make you any broiled vegetables.

The W. leaves and comes back.

W: We cannot make any broiled vegetables because the broiler is broken.

C: (becoming agitated) O.K., O.K. Do you have anything on the menu? What is the special for today?

W: Let me go and check. I will ask the cook.

The W. leaves and comes back.

C: Well? What is the special for today?

W: Excuses!

End

Second Bite

Skit opens with customer sitting at the table with a bowl that is assumed to be full of soup.

C: (looking into the soup and becoming disgusted, putting the spoon down) Oh, Waiter/Waitress, what's this fly doing in my soup?

W: (coming over and looking into the bowl of soup) Hmmm, looks like the backstroke!

End

Third Bite

Skit opens with customer sitting at the table with a bowl that is assumed to be full of soup.

C: (tasting a bowl of soup and then becoming disgusted) Oh, Waiter!

W: (coming over) Yes?

C: This soup tastes funny.

W: Then why don't you laugh?

End

Fourth Bite

C: (watching the Waiter bring out the soup and place it before her/him and rubbing hands together) Oh, boy. It's been a long time since I've had a good bowl of soup.

W: (turning towards the crowd) And it's going to be even longer than he/she thinks!

End

Fifth Bite

The customer from the previous bit is eathing his/her soup.
C: (becoming dissatisfied with the soup) Hey Waiter! This tomato soup tastes like old dishwater.

W: (coming over and looking in) That's because it's not tomato soup and it is dishwater. You should have ordered tomato soup instead. It's much better.

End

Oh Suzanna

D   E   A
Oh, I come from Alabama with a banjo on my knee,
*   D   A7   D*
and I'm going to Louisiana, my true love for to see.
*   E7   A*
It rained all night the day I left; the weather it was dry.
*   D   A7   D*
The sun's so hot I froze to death; Suzanna don't you cry.
G   D   A
Oh, Suzanna, don't you cry for me;
*   D   A7*
I've come from Alabama with a banjo on my knee.

La Bamba

CF G7   CFG7   C
Para Bailar la Bamba, Para Bailar la Bamba,
* F   G7   C   F   G7   CF*
Se Ne-ce-si-ta un poca de gracia
*   C   F   G7*
Un-a poca de gracia para mi para ti y
*   CFG7*
ar-ri-ba ar-ri-ba
CFG7   C   F   G7
Ar-ri-ba ar-ri-ba por ti se re por ti se re
C   F   G7
se re.
*   C   FGCFG7*
Yo no soy mar-i-ne-ro
*   C   F   G7*
Yo no soy mar-i-ne-ro, soy cap-i-tan
*   C   F   G7*
Yo no soy mar-i-ne-ro, soy cap-i-tan

Chorus:
* C   F   G7   C   F   G7   C   F   G7   C   F   G7*
Bam-ba bam-ba bam-ba bam-ba bam-ba bam-ba bam-ba bam-ba

Everyday People

            G   C   G
1. Sometimes I'm right and I can be wrong
                          C   G
My own beliefs are in my song

The butcher, the banker,
C   G
the drummer and then
                                    C   G
Makes no difference what group I'm in
C G   C   G
I am everyday people, yeah, yeah

2. There is a blue one who
          G
can't accept the green one

For living with a fat one
C   G
trying to be a skinny one
                                    C   G
And different strokes for different folks
                                 C   G
And so on and so on and scooby dooby doo-bee
          C   G   C   G
Oh, sha - sha- we got to live together

3. I am no better and neither are you
We are the same whatever we do
You love me- you hate me- you know me and then
You can't figure out the bag I'm in
I am everyday people, yeah, yeah (same chords as Vs.1)

4. There is a long hair that doesn't like the short hair
For bein' such a rich one that will not help the poor one
And different strokes for different folks
And so on and so on and scooby dooby doo-bee
Oh, sha- sha we got to live together. (same chords as Vs. 2)

5. There is a yellow one that won't accept the black one
That won't accept the red one that won't accept the white one
And so on and so on and scooby dooby doo-bee
Oh, sha-sha- we got to live together. (same chords as Vs. 2)

Mamas Don't Let Your Babies Grow Up To Be Cowboys

Chorus:
D *G*
Mammas don't let your babies grow up to be cowboys.
A7
Don't let them pick guitars and drive them old trucks
D
Let them be doctors and lawyers and such.
G
Mammas don't let your babies grow up to be cowboys
A7
'Cause they'll never stay home and their always alone
D
even with someone they love.

D *G*
1. Cowboys ain't easy to love and they're harder to hold.
A7 *D*
They'd rather give you a song than diamonds or gold.
Lone Star belt buckles and old faded Levis
G
and each night begins a new day.
A7
If you don't pull together and he don't die young
D
he'll probably just ride away. (chorus)

D *G*
2. Cowboys like smokey old pool rooms and clear mountain mornings
A *D*
little warm puppies and children and girls of the night.
Them that don't know him won't like him
G
and them that do sometimes won't know how to take him.
A
He ain't wrong he's just different but his pride
D
won't let him do things to make you think he's right. (chorus)

If I Had A Hammer

A D
1. If I had a hammer,
E7 A E7 A
I'd hammer in the morning,

I'd hammer in the evening,
E7
All over this land,
A A7
I'd hammer out danger,
D
I'd hammer out a warning,
A
I'd hammer out the love between
D A
My brothers and my sisters
DAE7 A E7 A
All over this land.

2. If I had a bell,---

3. If I had a song,---

4. Well, I got a hammer,
And I got a bell,
And I got a song to sing,
All over this land.
It's a hammer of justice,
It's the bell of freedom.
It's the song about the love between
My brothers and my sisters,
All over this land.

Take Me Home, Country Roads

   G   *Em*   *D7*   *C*   *G*
1. Almost heaven, West Virginia, Blue Ridge Mountains, Shenandoah River.
   G   *Em*
Life is old there, older than the trees
   D7   *C*   *G*
Younger than the mountains, growing like a breeze.

Chorus:
   G   *D7*   *Em*   *C*
Country roads take me home, to the place I belong;
              G   *D7*   *C*   *G*
West Virginia, Mountain Mama, Take me home, country roads.

2. All my memories, gather 'round her,
Miner's lady, strangers to blue water,
Dark and dusty, painted on the sky
Misty taste of moonshine, tear drops in my eye. (chorus)

   Em   *D7*   *G*
3. I hear her voice in the morning hours, she calls me,
      C   *G*   *D7*
The radio reminds me of my home far away,
      Em   *(D)F*   *C*
And driving down the road I get a feeling that
   G   *D*   *D7*
I should have been home yesterday, yesterday.

Raindrops Keep Fallin' On My Head

C Cmaj7
Raindrops keep fallin' on my head.
C7
And just like the guy whose
F Em7
Feet are too big for his bed,
A7 Em7
Nothin' seems to fit
A7 F G7
Those raindrops keep fallin' on my head

They keep fallin'.

So I just did me some talkin' to the sun.

And I said I didn't like the way he got things done,

Sleepin' on the job.

Those raindrops are fallin' on my head.

They keep fallin'.
C Cmaj7
But there's one things I know,
F G7 Em7
The Blues they send to meet me won't defeat me.
Am F Dm7 G7
It won't be long till happiness steps up to greet me,
C Cmaj7
Raindrops keep fallin' on my head,
C7
But that doesn't mean
F Em7
My eyes will soon be turnin' red.
A7 Em7 A7 F
Cryin's not for me 'cause I'm
G7
never gonna stop the rain by complainin'
C Cmaj7 f
Because I'm free---
G7 C C7
Nothin's worryin' me,

Those raindrops keep fallin' on my head... (fade out)

The Donkey and the Little Dog

A rich Farmer had a Donkey that worked hard for him, and he also had a little Dog that he loved very much. After the hard work of the day was over, the Farmer liked to sit and play with the little Dog.

The Donkey watched the Farmer and the little Dog play together. The Dog jumped around and wagged his tail. The Farmer gave the little Dog something good to eat. And when the little Dog was tired of playing, he jumped up into the Farmer's lap and wnet to sleep.

The Donkey thought to himself, "I work very hard for the Farmer. I carry heavy loads on my back, But the little Dog does nothing but play and eat and sleep on the Farmer's lap. The little Dog has a very easy life. If I did like he does would my life be easier? I think I shall try it."

So one day when the Farmer was resting after a day's work, the Donkey went to where he was sitting. The Donkey jumped and danced around and tried to wag his tail as he had seen the little Dog do.

The Farmer laughed and laughed. He had never seen a Donkey jump and dance before.

The Donkey soon got tired of jumping and dancing so he tried to sit in the Farmer's lap as he had seen the little Dog do.

The Farmer became so afraid when the Donkey tried to sit in his lap that he called his Servants.

The Servants came with big sticks.

"Drive this Donkey away," cried the Farmer. "He is trying to kill me."

The Servants beat the Donkey with their big sticks. They tried to drive him away.

The Donkey cried, "Farmer, Farmer, you let your little Dog sit on your lap. Why will you not let me, your hard working Donkey, sit on your lap?"

The Servants laughed and laughed at the Donkey.

"You cannot act like a little Dog when you are a big Donkey," said the Servants. "There is a place for everyone. Little Dogs go into the house and are petted. Donkeys stay in the barn and work. A little Dog cannot work, and you cannot sit on any one's lap. Be glad you have a nice barn to live in and never try again to be what you are not." CI-51

The Cats and the Monkey

Once upon a time two cats found a large piece of cheese. They carried it outside the house into the garden. And then they broke it into two pieces.

"Your piece of cheese is bigger than mine," said the Black Cat.

"No, no, no," said the White Cat. "My piece of cheese is smaller than yours."

The two Cats talked and talked about the size of the pieces of cheese. Soon the Black Cat said,

"This talking is getting us nowhere. Let us go and ask the wise old monkey to tell us who has the bigger piece of cheese."

And so the Black Cat and the White Cat went to the wise old Monkey who lived in the garden.

"Tell us, wise old Monkey," said the White Cat, "which of these two pieces of cheese is the bigger."

"Ah," said the Monkey. "You can see that the piece of cheese on this side of the scale is too heavy. I will take a bite."

The Monkey took a big bite of cheese.

"Look," said the Monkey. "The piece of cheese on the other side of the scale is too heavy now. I will have to take a bite off of that piece of cheese."

And the Monkey took a big bite of cheese.

The Cats did not want the Monkey to eat their cheese and so they said,

"Give us back our cheese, wise old Monkey. We will take it away and eat it."

But the Monkey said,

"No, you cannot take the cheese away until I have done what you asked me to do. I will make one piece of cheese just as big as the other piece of cheese."

The Monkey took a bite off of one piece of cheese and then a bite off the other piece of cheese. The Cats stood by with tears in their eyes and watched their cheese get smaller and smaller.

At last there were two very small pieces of cheese left. The Monkey said he thought that one piece of cheese was just as big as the other piece of cheese. But just when the Cats thought they were going to get the little pieces back the Monkey said, " Of course, my dear Cats. I know you wish to give me a present for helping you in the matter of cheese. I like this cheese so much that I will take these two small pieces of cheese for my present. Thank you very much."

And the Monkey ate the last two bits of cheese.

A Bird Came Down The Walk
by Emily Dickenson

A bird came down the walk:
He did not know I saw;
He bit an angle-worm in halves
And ate the fellow, raw.

And then he drank a dew
From a convienient glass,
And then hopped sidewise to the wall
To let a beetle pass.

He glanced with rapid eyes
That hurried all abroad---
They looked like frightened beads, I thought;
He stirred his velvet head

Like one in danger; cautious,
I offered him a crumb,
And he unrolled his feathers
And rowed him softer home

Than oars divide the ocean,
Too silver for a seam,
Or butterflies, off banks of noon,
Leap, plashes, as they swim.

Seal Lullaby
by Rudyard Kipling

Oh, hush thee, my baby, the night is behind us,
  And black are the waters that sparkled so green,
The moon o'er the combers, looks downward to find us
  At rest in the hollows that rustle between.
Where billow meets billow, there soft be thy pillow;
  Ah, weary wee flippering, curl at thy ease!
The storm shall not wake thee, nor shark overtake thee,
  Asleep in the arms of the slow-swinging seas.

SEE IT--SKETCH IT

Focus	To demonstrate simplified drawing and sketching techniques and develop personal visual records of nature.
Group Size	Entire class, then small groups
Time Required	1.25 hours (*each activity*)
Materials	Ball point pens Activity packet Hard, flat surface (*clipboards*) Resident Cispus artist, John Pitcher. **YOU MUST MAKE ARRANGEMENTS WITH JOHN SEVERAL WEEKS PRIOR TO YOUR ARRIVAL TO ENSURE HE'S AVAILABLE.** Handouts: ***Pure Contour Drawings*** ***Contour Drawings With Notes*** ***Shapes and Shadows***
Physical Setting	Classroom, then outdoors at three seperate locations

Process

Meet with John Pitcher in his classroom. Students will be shown "contour drawing" and "modified contour drawing" techniques. These are the same techniques John uses in many of his field observations.

Activity 1: LOOK DRAW --FIRST TRY

1. John will take the group outside near his classroom and set everyone down.

2. Simple subjects will be chosen by each individual: a hand, a section of bark, a leaf-and drawn using the "pure contour" technique.

3. While trying this style the drawers eyes must be on the subject only while the pen is kept on the paper without lifting. See sample drawings.

Activity 2: BLOCK IN THE SHAPES AND SHADOWS

1. Divide into two groups.

2. Walk one group out the main entrance and right about 1/4 mile to the field adjacent to the fire station. Walk the other group down the path towards the confluence of Yellowjacket creek and the Cispus river.

3. Because a lot of concentration is required during this time everyone should be seperated to allow appropriate focusing.

4. Allow 15 minutes for students to follow the instructions on the handout (see ***Shapes and Shadows*** for helpful hints) and then allow them to compare their creations. Use pens so students can't erase, this will help improve their concentration level.

5. Students can try a "pure contour" sketch of something small if time permits after the this "block shaping" activity.

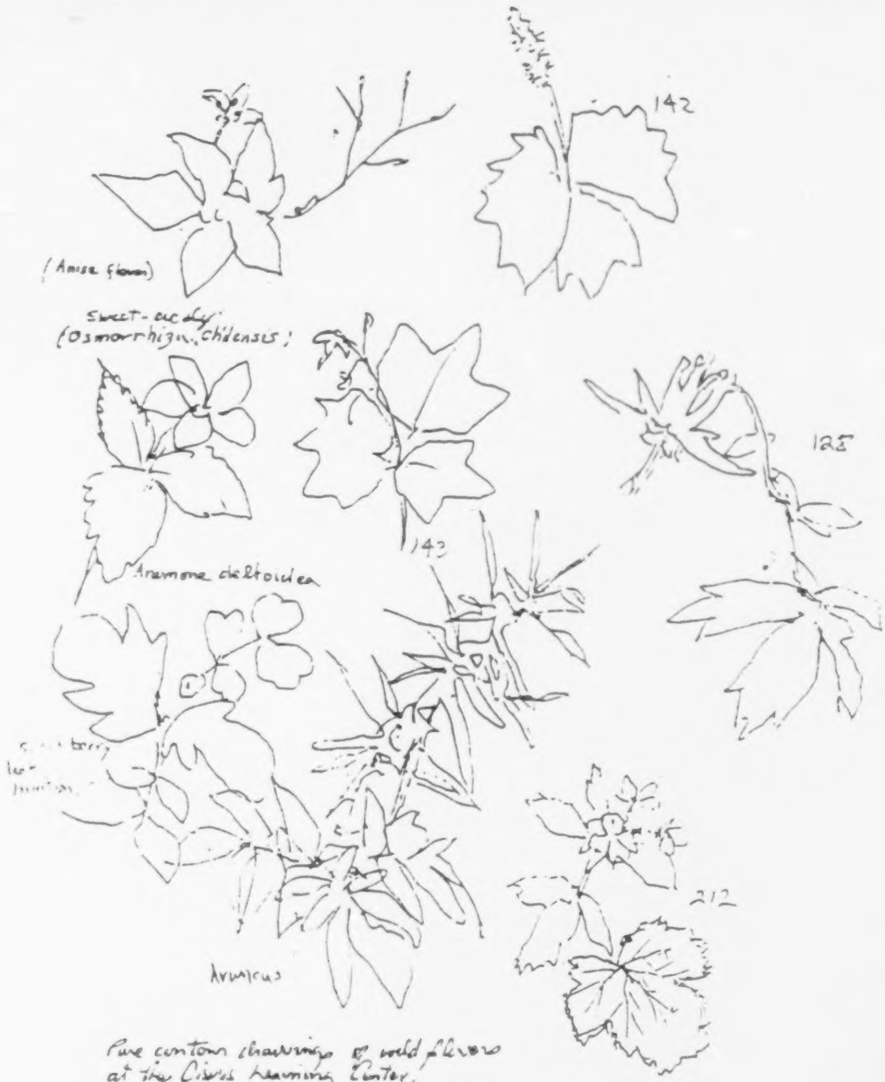
6. Walk back to the Center and switch sites with the other group.

Look Draw--First Try

Choose a small subject like a leaf, mushroom, flower or something else suitable. Now carefully focus in and study your subject. While keeping your eyes on your subject slowly draw the shape WITHOUT LIFTING THE PEN FROM THE PAPER AND WITHOUT GLANCING AWAY FROM YOUR SUBJECT. Use a large area of the sketch sheet. After you have completed the basic shape then look and make any refinements you wish. With further practice you will get better and better.

Block in the Shapes and Shadows

Behold the entire panarama now spread before you and take a deep breath. Now, deside what part of it you want to draw on your paper. Use a "modified contour" drawing technique--glance back and forth from paper to subject. Follow these helpful hints. Lightly outline the general shapes and shadows. Then add more details drawn inside the major shapes. Objects in the foreground should be more defined and darker. Take your time and have fun.


142
(Anise flower)
Sweet-cicely
(Osmorrhiza chilensis)
125
Anemone deltoidea
143
212
Aruncus

Pure contour drawings of wild flowers
at the Cispus Learning Center,
Randle, WA 12 June, 88

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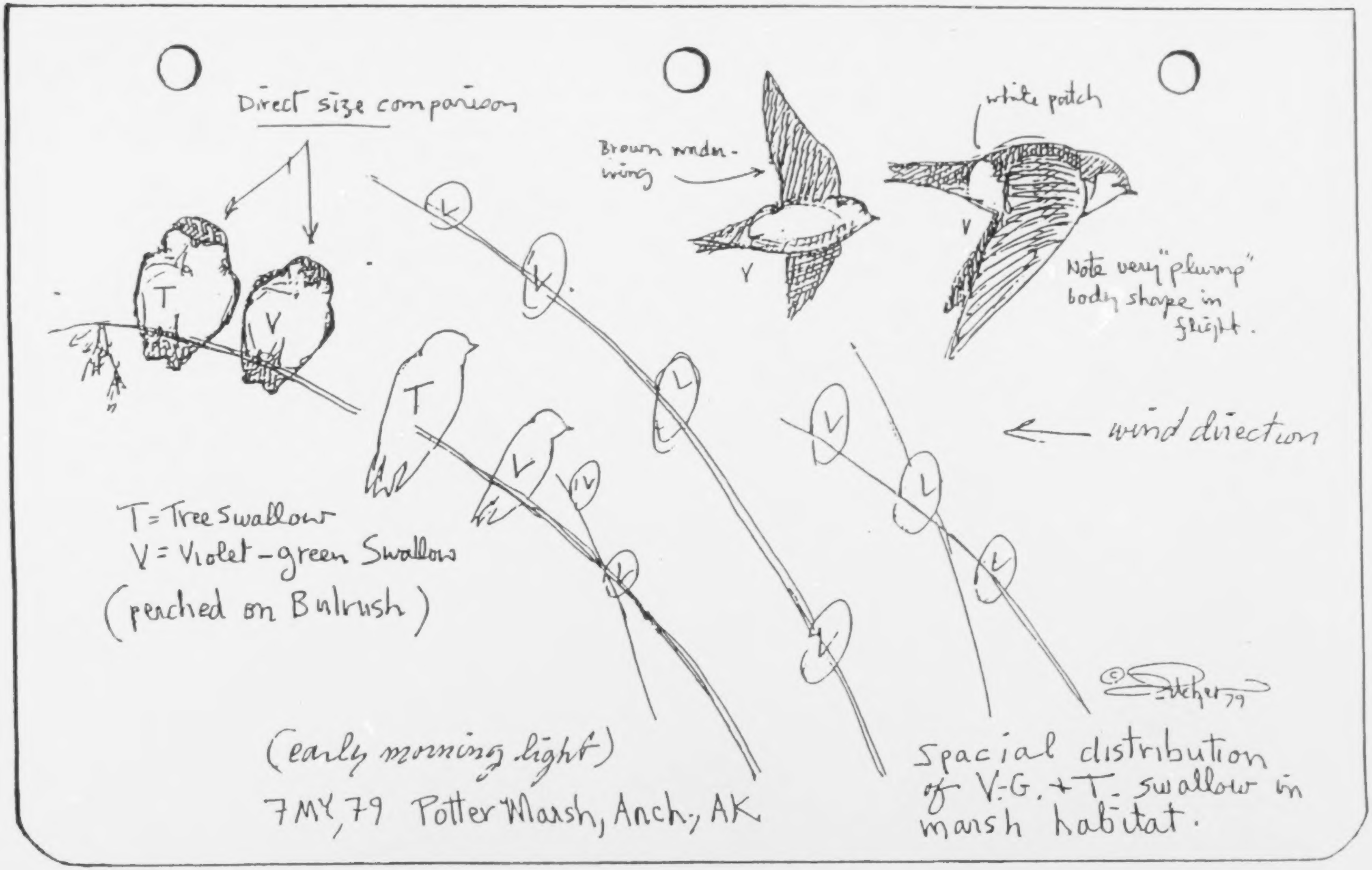
Direct size comparison
T
V
Brown underwing
V
white patch
V
Note very "plump" body shape in flight.
wind direction
T
V
T=Tree Swallow
V=Violet-green Swallow
(perched on Bulrush)
(early morning light)
7MY,79 Potter Marsh, Anch., AK
Spacial distribution of V.-G. + T. swallow in marsh habitat.

The information gathered while drawing is more important than how good or how detailed the art is. Quick diagrams, at times, is all that is needed to illustrate the point.

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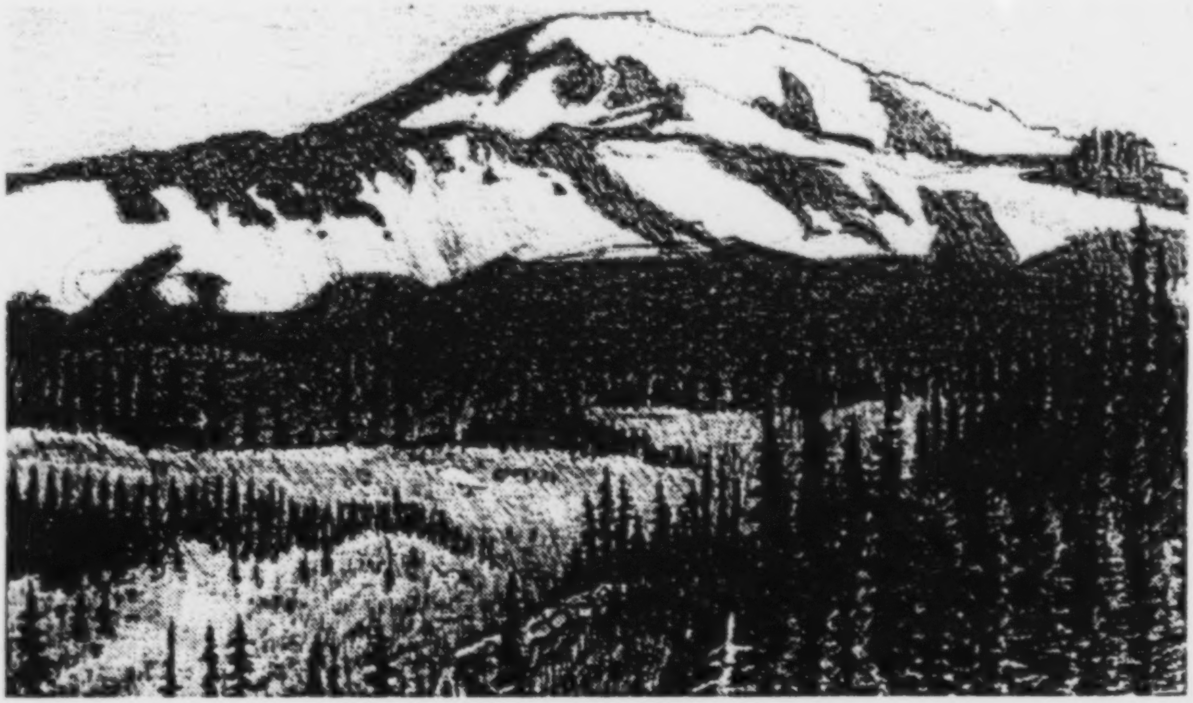
Shapes and Shadows



John Pitcher, Cispus Learning Center, Randle, WA

Notes on the Artist's style: ***Modified contour method using blocking style for shapes and shadows***

- Major shapes and shadows are blocked out first: An outline is lightly drawn around the shapes
- The foreground is darker and in more detail
- The Details are added last

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TREASURE POUCH/NAMETAG

Focus To illustrate Native American use of resources by producing a treasure pouch/nametag as a personal souvenier of the Cispus experience.

Group Size 8 Students

Time Required 1-1.5 hours

Materials
Leather Punch
Sharp Sissors
Ruler
Pen or Marker
Woodburning tool
Tanned deer skin scraps (*available from Quilceda Tannery, Marysville, Wa*)
2 - 10mm wooden beads with 2mm holes (*optional*)
Handout: ***Pouch Pattern***

Physical Setting Standard Classroom or outside with table

Process

1. Cut 3&1/2" x 6" rectangular piece of leather (Fig. 1).
2. Cut 1/4" x 30" strip of leather.
3. Fold rectangular piece up 2&1/2" from bottom (fig. 2).
4. Mark holes to be punched as indicated in figure 2.
5. Punch holes (using smallest size die punch) as indicated in figure 2.
6. Cut points onto ends of 30" leather strip.
7. Weave leather strip as indicated in figure 2.
8. Burn name into lower 1&1/2 inch of pouch.
9. Close pouch by folding flap down (fig. 3).
10. Pouch may be decorated by threading beads onto ends of leather strip and knotting the ends.
11. Any other creative ideas are encouraged.

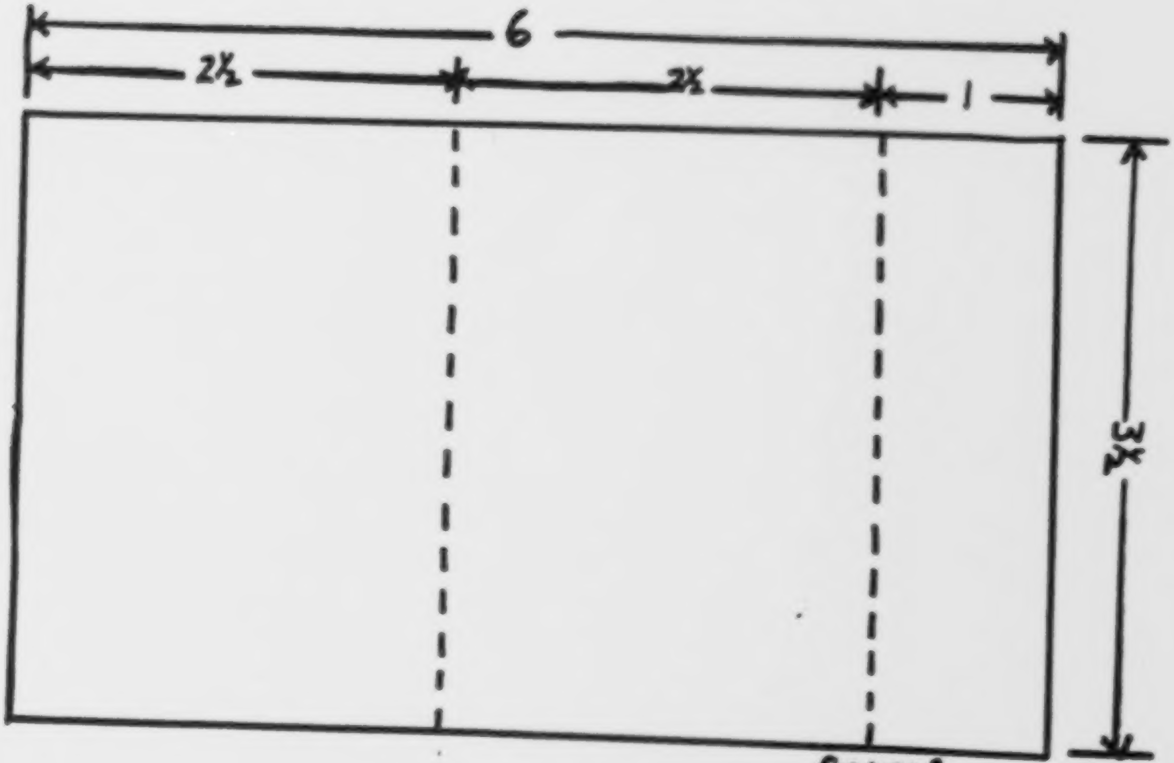

figure 1

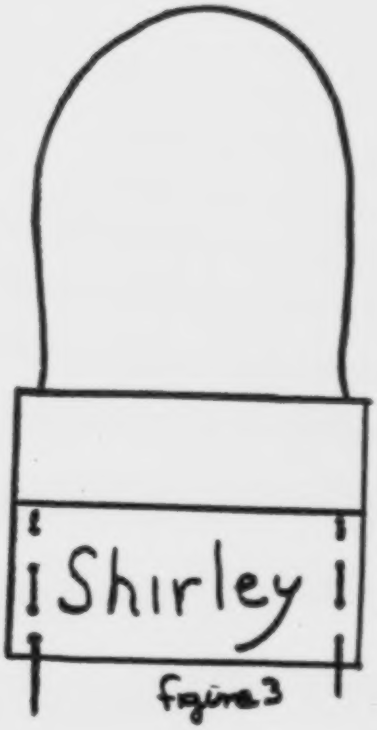

figure 3

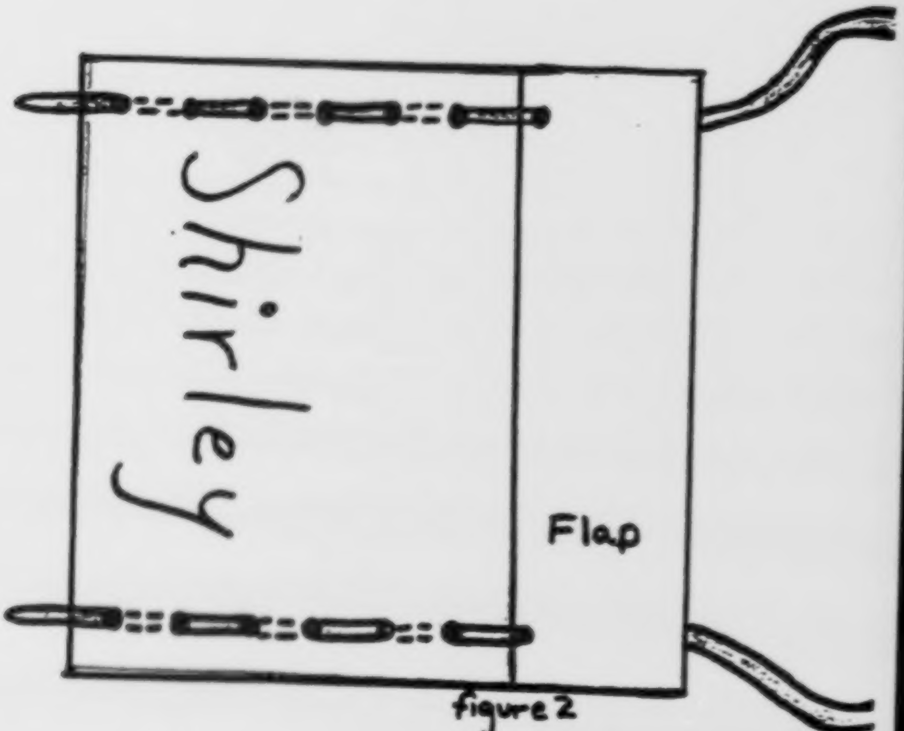
Shirley
Flap

figure 2

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Grizzly Adams Handbook

outdoor survival and nutrition

BACK YARD SALVE AND SALADS

Focus	To guide inquiry and investigations of plants in their natural state during the late winter and early spring months.
Group Size	Entire class
Time Required	2.5 hours
Materials	Discovery Journal Pencil *Optional:* Thermos of boiling water Paper cups and litter bag Tea ball Handout: ***Forest Pharmacy: Medicinal and Edible Plants at Cispus***
Physical Setting	Covel Creek Trail/ Braille Trail
Process	1. Instructor leads students to the trail head of Covel Creek Trail and reviews trail use and procedures (***1-2-3 Left-Right-Left and Keep It Green***). Then leads the group down the trail, pointing out and sampling the plants. Take care not to over-sample areas or to sample endangered/rare plants.

A hike down any of the Cispus trails during the winter or early spring months can be beneficial even if plants are not budding or flowering. The following represent a few procedures that have met with success in ensuring a safe and productive trip.

TRAIL PROCEDURES: While students may sample certain plant parts in small quantities, it should be emphasized that no plant may be completely removed from its surroundings (pulled up by the roots). Nor should students ever venture off a marked trail prior to checking with their instructor.

LAP BOARDS: A Discovery Journal (with a simple lap board made of wood laminate covered with a small sheet of visqueen) acts as a sketch board with which a student can draw or make notes of tastes or procedures encountered while on the trail.

THERMOS: Bringing a thermos of boiled water adds a special end-of-trail-treat. Students may search for wild ginger along the trail and gather about ten medium-sized leaves. These leaves go into the tea ball, which is deposited into the thermos. If allowed to brew for about 45 minutes, the leaves will make an enjoyable herbal tea.

DO-IT-YOURSELF SURVIVAL KIT

Focus To use discussion, guided inquiry and creative problem solving skills in creating a usable survival kit for hiking or camping.

Group Size Entire class

Time Required 45 minutes

Materials *Per student/survival kit:*

Foil pan
Scissors
Bouillon cubes
Fire starter/flint
Sandpaper
Nylon fish line
Wooden matches
Electrical tape
Small whistle
Plastic wrap
First-aid kits
Fish hook
Sugar cubes
Tea bags
2 salt packets
Plastic film cannisters
Emergency candle
H_2O purification tablets
2, 30-gallon garbage/leaf bags
1-gallon size ziplock plastic bag
Handout: ***Survival Kit Basics***

Physical Setting Standard classroom, with a follow-up activity at the Cispus River

Process

Activity 1: BUILDING YOUR KIT

1. Discuss the body necessities in a survival situation. Stress the need for warmth, protection from the weather and energy needs. Ask how you could prepare a small, yet effective packet to meet all these needs (kits should be able to fit into the 1-gallon ziplock bags). Make a list on the board of all the items suggested. Refine the list to meet space and efficiency requirements.

2. Once you have decided upon the essentials, it is time to put your kits together. Use the 1-gallon size ziplock plastic bags to seal up all the items in your kit. Write names on the bags using a permanent marker. Stress organization and neatness in packing the kits.

Activity 2: ONE MATCH FIRE CONTEST

1. In the classroom discuss common sense fire rules. Divide the class into groups of 5 students.

2. Discuss/brainstorm various ways to build a fire and tell them that their challenge will be to start a fire using only one match. The key is in the planning and preparation.
Use an area down at the Cispus River for this activity.
This is great for the early evening. As the sun sets you can have marshmallows and songs by one of the fires.

Survival Kit Basics

The kit that you design should help you to meet the necessities of life during an outdoor emergency situation. It will contain items to provide for the following needs:

INSTANT INTERNAL WARMTH:	*Treatment for accidental body heat loss.* Your inner body must be at or near the optimum temperature of 98.6F, for living cells to produce the energy to sustain life. Use the foil pie pan for a cooking pot, and candle and matches as heat sources.
INSTANT BODY PROTECTION:	*Conserve your limited energy supply.* Plastic garden bags help retain the vital, warm air layer around your body by keeping you dry and lessening the transfer of warm air with cold air.
INSTANT ENERGY:	*You will have a given amount of energy at the time of your emergency.* It can be conserved to last a long time, or it can be used up very quickly. Sugar, bouillon cubes and salt packets give your muscles what they need to maintain a chemical balance and keep your body at a nearly constant 98.6F.

Survival Kit Content Suggestions

FOIL PAN	Pot pie-size to use for boiling water. Pack some of the smaller items in it.
CANDLE	Emergency or plumber's candle will help kindle a fire or heat 1/4 cans of water.
MATCHES	Wooden matches will provide the spark for a heat source. Cut and glue a small piece of sandpaper to the inside lid of the container holding the matches. Use it to strike the matches.
LEAF/GARBAGE BAGS	Use a 30-gallon size bag. Pull one bag up over your legs (punch holes for feet) and tuck the rest into your pockets to protect legs from wind and rain. Cut a hole in the sealed end of the other bag for a face and head opening. Do not leave your face covered. These bags can be used for protection from rain, cold and sun.
SUGAR CUBES, BOUILLON CUBES, SALT PACKETS, AND TEA BAGS	Six cubes of sugar will give you the instant energy needed to move muscles for heat production. Bouillon cubes will help maintain your internal warmth. The human body needs adequate salt to keep body chemistry balanced. Adequate salt intake will also help retain moisture in your system. It's important to drink as much as 3 quarts of water a day.
WATER PURIFICATION TABLETS	Drop the tablets in water which is not boiled. This will help prevent *giardia* and other water inpurities which can make you sick.

TAPE:	Electrical tape may be used to close face openings, patch clothing, secure top and bottom plastic, emergency bandage tape, etc. Attach tape to the inside of the ziplock bag.
FISH LINE & HOOK:	These can be used for fishing and repairing things.
PLASTIC FILM CONTAINERS:	Plastic film containers work well for storing sugar cubes, bouillon cubes, water purification tablets and matches. Fish line and hook can also fit into a film container.
FIRST-AID KIT:	The contents of this kit can help patch you up and save your energy until you can reach help.
SMALL WHISTLE:	The surrounding trees muffle shouts, but a whistle will sound out clearly. Also, you can sound it for a long time without becoming tired.
SMALL MIRROR:	A mirror can be used to reflect light and signal help. It can also be broken and used for a cutting edge if you don't have a knife.
BOX-CUTTER/ SINGLE-EDGE RAZOR BLADE:	A box-cutter or single-edge razor blade is sharp enough to use in cutting a variety of things.
PIECE OF WIRE:	Wire is useful for tying and repairing things.

Fire Building:

a. **COLLECT MATERIALS** ahead of time

b. **BUILD AWAY** from overhanging trees or bushes

c. **CHOOSE** an area protected from wind

d. **CLEAR GROUND** area well

e. **FIRE CIRCLE** should be made of stones

f. **KEEP FIRE SMALL**

g. **MAKE PILES** of tinder, kindling and larger pieces of wood

h. **LAY FIRE CAREFULLY**, starting with tinder and building with kindling; add larger pieces last

i. **PUT FIRE OUT DEAD** before leaving. It should be cool enough to touch. **DROWN** with water & cover with dirt.

SURVIVAL SNACK

Focus To create a nutritious snack that meets the energy needs of hikers, using guided inquiry and discussion.

Group Size 5-10 students

Time Required 30 minutes

Materials
Measuring cups
Large spoons
Jar with a lid
Granola ingredients
Mixing bowls
Large cookie sheet
Zip-lock plastic bags
Oven (*the Cispus cooks are willing to accomodate your needs if you let them know well in advance. I have found that 9-10 a.m. is a very good time for them.*)
Handout: ***Granola Recipe***

Physical Setting Dining hall (*preparation*), Angel Falls trail (*hike & snack*)

Process

1. Tell your students that they will be taking a strenuous hike through the woods and part-way up a mountain leading to Angel Falls. The hike requires students to examine ways to practice energy conservation. They will need to prepare a survival snack.

2. As a group, discuss some basic energy needs and brainstorm foods that will provide a lot of energy. Make a list of the ideas, then have the students decide which items would be best for their survival snack.

3. Explain that there are some basic ingredients needed for their granola snack. Discuss the benefits of each. Then have the group decide which items from their list they would like in their high energy snack. Have on hand many popular additions such as M&M/s, chocolate chips, raisins, nuts, etc.

4. Divide the class into two groups, one for dry ingredients and one for liquid ingredients. Hand out the basic recipe and have each group begin mixing. When both dry and liquid ingredients are mixed, follow the recipe to completion. Have a counselor or adult stay around to remove the granola from the oven and stir in the remaining, meltable ingredients.

5. Counselors or small groups of students put the granola into bags. Leave the bagged granola with the cooks, they will put it into sack lunches for the hike to Angel Falls. If you are not taking a lunch along, take the packed granola with you. Encourage hikers to eat the snack whenever they take a rest stop and need some energy. **Remind them to carry all garbage back to camp.**

Granola Recipe

BASIC INGREDIENTS

8 cups rolled oats
1.5 cups packed brown sugar
1.5 cups wheat germ
8 oz. package shredded coconut
1.5 cups sunflower seeds
1.5 cups peanut halves
0.5 cup vegetable oil
0.75 cup honey
0.25 cup water
2 tsp. vanilla

SUGGESTED INGREDIENTS

M&M's (original, peanut butter, almond)
Dried fruit
Reese's pieces
Raisins (brown, white)
Chocolate chips (dark or white)
Butterscotch chips
Almonds, cashews

Directions:

1. **BLEND** in a large bowl:
    8 cups rolled oats
    1.5 cups packed brown sugar
    1.5 cups wheat germ
    8 oz. shredded coconut
    1.5 cups sunflower seeds
    1.5 cups peanut halves

2. **SHAKE** to mix in a jar:
    0.5 cup vegetable oil
    0.75 cup honey
    0.25 cup water
    2 tsp. vanilla

3. **POUR** liquid mixture over dry mixture in a large bowl. **ADD** any additional, non-meltable goodies. **STIR** with a large spoon until all ingredients are moistened.

4. **SPREAD** moistened ingredients over a foil-covered baking sheet.

5. **BAKE** at 325F for 25 minutes. **STIR** once during baking.

6. **COOL** baked mixture.

7. **ADD** meltable ingredients to cooled mixture.

8. **STORE** in sealed plastic bags.

9. **ENJOY!**

Another Look

conservation and planning

A POPULATION SITUATION

Focus	To examine the factors that affect a population, including predation and population size.
Group Size	20-23 students
Time Required	45 minutes
Materials	Small foods (*M&M's, peanuts, etc.*)
Physical Setting	Any open space
Process	1. Discuss food chains and populations, defining basic terms (predator, prey, etc.) 2. Discuss game rules, divide students into appropriate groups, and play.

Discussion:
Talk about the observations made, effects of population size, offects of pradation, and factors missing from the game that exist the real world (reproduction, disease, replenishment of food supply, hunting, etc).

How to Play:

student roles
Prey: 18 students (two large groups of 6, two small groups of 3)
Predators: 2 students (one preys on a large group, one on a small group)

additional roles
Rangers: 1-2 students (one insures that feeding and predation rules are being followed, a second may record prey populaitons)
Scavenger: 1 student (removes "dead" prey to a separate area)

food chain relationships/game play
•**Prey:** each prey group begins with 30 food units. In one "week" (instructor will designate the passage of a week every few minutes) each member of the prey group will consume one food unit (one M&M). If a prey population consumes all it's food resources all members of the group will die during the next week, when there is no food available for them.

•**Predators:** At the end of every two weeks, a predator consumes one member of the prey population to which it is assigned. Prey can only be consumed from populations that have been assigned predators. A member of the prey population is consumed only after it has eaten it's weekly food unit. No prey is consumed at the end of the sixth week. Predators do not die during the course of the game.

•The game continues for six weeks. Prey populations are reported and compared at the end of each week. The Scavenger, if included, will remove the "dead" prey, so that they do not interfere with the progress of the game. The numbers given for prey, predators, and food supply are one workable set. Other combinations can be tested and the results observed.

BLOWN AWAY

Focus To illustrate the effects of improper clearcutting techniques.

Group Size 30 Students

Time Required 2 Hours (*May be combined with **NOWHERE IS AWAY***)

Materials Human resource: Bruce Haney, Toxicologist **BE SURE TO ARRANGE, THROUGH CISPUS STAFF, ONE WEEK IN ADVANCE FOR MR. HANEY'S PRESENTATION.**
Large fan (*Available from kitchen*)
Pieces of paper
Field Journal

Physical Setting Logging Room
Bruce Haney's property, located 1 mile west of Cispus Center

Process **ACTIVITY 1:**

This part of the lesson is spent in the Logging Room using the fan and small pieces of paper.

1. Spread the paper out on a table near one end of the room and set the fan on another table about ten feet away, facing the table with the paper pieces. Have the students stand between the two tables. Turn on the fan and notice the effects of the fan upon the papers. Have the students move from between the tables and once again note the effects of the fan upon the paper.
2. Introduce Bruce Haney who will discuss some of the effects which clear cutting has upon the environment.

ACTIVITY 2:

For this part of the lesson, the students will walk to the property of Bruce Haney.

1. Bruce Haney will discuss the effects which clearcuts on adjacent property have had on his property.
2. Students will take field notes of their observations and draw conclusions discussing 5 possible effects of the use or disposal of pollutants into the environment.

ACTIVITY 3:

1. Students will journalize one important lesson which they have learned today and discuss how this impacts their lives in previously unknown ways.

***NOTE**: The lesson, **NOWHERE IS AWAY**, also includes Bruce Haney's property and Mr. Haney as a resource. Combining these lessons will save 1 hr. (approx.) in travel time.*

CISPUS SCIENCE TEAM

Focus To develop and improve observational and recording skills while working as a member of a team.

Group Size 18-30 (*3-5 teams, with 6 members each*)

Time Required 3 hours

Materials

Per student:	*Per team:*
Pencil	4 Plastic sample cups
Eraser	2 Magnifying glasses
Clipboard	2 Thermometers
Specialist task packet	2 Rulers

Physical Setting Yellowjacket Ponds Trail

Process

INSTRUCTOR INFORMATION:

The intent of this activity is to give students an introduction to the investigation of nature in a qualitative and basic level. Students will also experience the completion of a goal as a team member. During the activity teams progress in two ways:

a. The educational objective of completing assigned tasks.
b. The physical objective of returning from Yellowjacket Ponds to Cispus.

1. In this activity, students are broken into teams consisting of six "specialists". Each member is assigned specific tasks that must be completed befor the team can advance along the trail (Students should be encouraged to seek help from teamates, but all answers must be written by the specialist assigned to the task).

2. Specific areas have been assigned where certain tasks must be completed:

Investigative Zone I--Yellowjacket Ponds
Investigative Zone II--trail from the Ponds, up to and including thebridge
Investigative ZoneIII--trail from the bridge back to Cispus

To encourage complete and satisfactory work, "Science Checkpoints" may be set-up at the end of each area and monitered by teachers or counselors. All members of a team are required to complete their tasks before the whole team may move on to the next area.

3. Students are often asked to explain observations they have made. They may not have the background to do this at a scientifically "correct" level. Encourage them to answer as best they can, as long as it is an answer that reflects thought. A summarizing discussion is a good way to work out those "not sure" answers. You may wish to have the groups display their papers in the dining hall or other visible location.

GETTING STARTED:

1. Lead the students down the Yellowjacket Ponds trail (stress no running on trails). Encourage them to observe their surroundings. As you leave Cispus, point out the trail that they will take down to the creek in Investigative Zone III (it's a well-defined trail just before you reach the dirt road crossing the main trail).

2. When you reach the ponds, introduce the activity:

> Scientists often have to work in a team to accomplish a goal. Many different scientists investigate the natural world. You will now work as a scientist in a team to collect information about the natural area along the Yellowjacket Ponds Trail.
>
> It is the year 2,2020, scientists have just learned that a neighboring volcano, Mt. St. Helens, will soon erupt. This wruption will be much larger that the one in 1980. he entire Cispus area will be covered with lava and rock. You are a member of a scientific team that will research this area. You will record information so that people will know what was here before the eruption. Your team will be made of six scientific specialists. As a scientist, your work must be complete and accurate. Remember that the volcano may erupt soon, and that you should work quickly. Your work will be checked at "Science Checkpoints" to make sure that you are completing your job, and not just trying to escape the blast zone. You may only pass these checkpoints when your whole team has completed its work for that Investigation Zone. Your teamates may help you, but all work on paper must be done by you. Good Luck!

3. Divide the class into teams and have them choose team names. Pass out the Specialist Task Packets and allow the students to choose their specialities. Students should write their names on papers now, no changes should be allowed after initial choices. As soon as all group members have their specialities picked out they may begin.

BOTANIST

A botanist is a scientist who studies plants: their life, structure, reproduction, growth, and classification. As the botanist in your team, you will study the plant life of the area.

GOOD LUCK!!

Team name:

Botanists Name:

INVESTIGATIVE ZONE I

These jobs should be completed in the Yellowjacket Ponds area before you start back on the trail.

1. Botanists study plant life in a variety of places. Start by examining the plant life of the pond.

A. Look at a plant growing in or on the water. Describe and draw the plant below:

Description:	Drawing:

B. Now you will look at a land-based plant, a tree. Choose one that you can see clearly, you will be studying the structure of the tree. Stand far enough away so that you can see all of the tree. Draw and describe what you see.

Description:	Drawing:

C. Now, walk up very close to the tree. Stand underneath its branches. Look up. Draw the tree as you now see it. Compare it to your first drawing and notice the differences.

D. As you stand next to the tree, notice the bark. Draw the bark in the space below.

E. Next, observe the leaves of the tree Draw a leav in the space below. If there are no leaves on the tree, write "No Leaves".

F. Now, compare the pond plant and the tree. Describe how they are different and how they are the same:

2. You have now observed and compared plants that grow in water and plants that grow on land. Now you will examine plants that grow in sunshine and those that grow in shade.
A. Go to an area at the edge of the forest where there is plenty of sunshine. Describe the plants you see:

B. Go to an area that is shaded by the trees of the forest. Describe the plants you see:

C. Now, compare the plants found in the sun and the plants found in the shade. Describe how they are differend and how they are the same.

INVESTIGATIVE ZONE II

This job should be completed as you walk back along the trail, but before you finish crossing the Yellojacked Creek bridge.

1. Trees are affected by many forces in their lives such as: animals, wind, fire, lightning, humans, diseases, and other plants. Choose one tree and describe how it has been affected by one or more of these forces:

INVESTIGATIVE ZONE III

This job should be completed as you walk back from the Yellowjacket Creek bridge to the Cispus Center.

1. The rings on the stump of a cut tree can tell us the age of that tree. To find the age of a tree, count the number of rings in the stump, and add 5 years. Find three cut trees of different sizes along the trail. Make sure you can see the rings clearly. Calculate the ages of the trees.

Tree #1________________________________

Tree #2________________________________

Tree #3________________________________

GOOD WORK BOTANIST! NOW DISCUSS YOUR FINDINGS WITH YOUR TEAM!

GEOLOGIST

A geologist is a scientist who is interested in the earth's crust (the rocks and soils of the earth). The geologist studies the parts of the earth's crust and the changes that take place in it. As the geologist in your team, you will study the soil and rocks of the area.

GOOD LUCK!!

Team name:

Geologists name:

INVESTIGATIVE ZONE I

These jobs should be completed in the Yellowjacket Ponds area before you start back on the trail.

1. Soil temperature is very important to plant growth.

A. Using a thermometer, measure the temperature of the air in a sunny area near the ponds.

Air temperature
in a sunny area __________ Degrees Farenheit

B. In the same sunny area, use a sharp stick to dig a small hole, 2-3 inches deep, into the soil. Place the thermometer down into the hole and take a temperature reading of the soil.

Soil temperature
in a sunny area __________ Degrees Farenheit

C. Move to an area that is shaded by the trees of the forest. Take readings of the air and soil temperature here.

Air temperature
in a shady area __________ Degrees Farenheit

Soil temperature
in a shady area __________ Degrees Farenheit

D. How are the soil temperatures different from the air temperatures?

E. Do you think plants will grow more quickly in a sunny or a shaded area? Why?

2. Not all rocks are the same. They are formed in different ways and are made from different materials. Geologists examine rocks and put them into different categories. Your next job will be to observe and describe some of the rocks of the pond area. Choose 4 different rocks. Look at their color, shape, and surface. Use your ruler to measure their size. Guess their weight. Draw the rocks in the spaces below and describe them using your observations.

Rock #1	Rock #2
Rock #3	Rock #4

INVESTIGATIVE ZONE II

These jobs should be completes as you walk back along the trail, but before you finish crossing the Yellowjacket Creek bridge.

1. Soil must contain nutrients if plants are going to grow in it. Nutrients taken by plants are returned to the soil through animal waste or the decaying remains of plants and animals.
A. As you walk along the trail, look for ways that nutrients are being returned to the soil. Describe two of these ways below:

2. As you stand on the bridge, observe Yellowjacket Creed. Think about the ways that the creek affects the rocks, soil, and land around it. Describe as many of these effects as you can think of.

INVESTIGATIVE ZONE III

This job should be done as you walk back from the Yellowjacket Creek bridge to the Cispus Center.

1. Soils may be different in different areas.

A. Collect some soil from the forest along the trail. Place it in one of your plastic cups. Observe it carefully. What color is it? What materials is it made from? Is there plant matter in it? Do you see animals in it? Describe what you see:

B. As you walk back to Cispus, you will see a trail leading down to the creek. At a safe place to reach the creek, collect some soil from near the water. Observe the soil as you did above and write a description of it:

C. Compare the forest and creek soil. If they are different explain why they are:

GOOD WORK GEOLOGIST! NOW DISCUSS YOUR FINDINGS WITH YOUR TEAM!

ZOOLOGIST

A zoologist is a scientist who studies animals: their life, habits, reproduction, growth and classification. As the zoologist in your team, you will study the animal life of the area.
GOOD LUCK!

Team name:

Zoologists name:

INVESTIGATIVE ZONE I:
These jobs should be completed in the Yellojacket Ponds area before you start back on the trail.

1. One sign of an animals activity is the footprints that it leaves. Search the pond area for the prints of animals. Look in areas where the soil is, or has been, moist and soft. Measure the prints and speculate about the animal that may have made them. Draw the prints below. Include your measurements and the type of animal you think made the print.

Print #1 type of animal:	**Print #2** type of animal:

2. Insects are the most common kind of creature in the world. Many insects use the pond area as their home. Search the edge of the pond and the nearby plants for insects. If you can, carefuoly catch some insects in your plastic cups for observation. Measure the insect. Draw the insects below and include your measurements. When you finish, return the insects carefully to their homes.

Insect #1	**Insect #2**

3. Even smaller animals are often found living in the water of ponds. Collect some water from the pond, using your clear plastic cup. Use your magnifying glass to examine the wate. Do you see any living things? (If not, try another cup of water). Draw any living things you have seen in the space below:

Pond life:

INVESTIGATIVE ZONE II:

These jobs should be completed as you walk back along the trail, but before you finish crossing the Yellojacked Creek bridge.

1. Footprints are not the only signs animals leave behind. The activity of some animals can ve very clearly seen. Observe the trees near the creek as you walk back to the bridge. Some of the trees have clearly been affected by an animals activity. Go over to the trees and examine them.

A. Draw what you see in the space below:

B. What animal has done this?

C. What part of its body do you think the animal used?

D. Why do you think the animal did this?

INVESTIGATIVE ZONE III:

These jobs should be done as you walk back from the Yellowjacket Creek bridge to the Cispus Center.

1. Logs that have fallen and are decaying are very important to the life of the forest. They are called nurse logs, because they give nutrients and homes to many animals and plants of the forest. Observe a nurse log very carefully. Describe any animal life, or signs of animal life that you find.

GOOD WORK ZOOLOGIST! NOW DISCUSS YOUR FINDING WITH YOUR TEAM!

METEOROLOGIST

A meteorologist is a scientist who studies the earth's atmosphere, climate, and weather. As a meteorologist in your team, you will study the weather conditions of the area

GOOD LUCK !

Team name:

Meteorologists name:

Table A: Wind Speed

The wind is an important part of the weather. A meteorologist must know how fast the wind is blowing. The table below will help you determine wind speed.

Observation	Description	Wind Speed in miles per hour (MPH)
No part of trees moving Smoke rises straight up, or drifts slowly	Calm	0-3
Leaves and twigs are moving	Slight breeze	4-12
Small branches and small trees are moving	Moderate breeze	12-20
Sarge branches moving	Strong breeze	20-30
Whole trees moving	Moderate gale	30-40

Table B: Forest Fire Danger

In the forest, a meteorologist can help to decide the fire danger level (how easy it would be for a forest fire to start). The table below will you determine the forest fire danger

Observation	Forecast
High temperature (above 70 degrees F) High winds Dry weather Dry fuel (leaves, grass, wood)	High Fire danger
Temperature between 60-70 degrees F Moderate or no wind Dry weather Dry fuel	Medium Fire danger
Low temperature (below 60 degrees F) No wind Rain or wet weather Wet fuel	Low Fire danger

INVESTIGATIVE ZONE I:

These jobs should be completed in the Yellojacket Ponds area before you start back on the trail.

1. Your first job will be to describe the weather conditions in the yellowjacket ponds area.

A. Use your thermometer to measure the air temperature at Yellowjacket Ponds.

Air temperature at
Yellowjacket Ponds =

B. Use the wind speed table to estimate the wind speed at Yellowjacket Ponds.

Wind speed
at Yellowjacket Ponds =

C. Estimate the fire danger in the Yellowjacket ponds area.

Fire danger at
Yellowjacket Ponds =

2. The sky and clouds can tell a meteorologist a lot about the weather.

A. Look up at the sky and describe its color:

B. If you see any clouds describe what they look like, and draw them in the space below:

INVESTIGATIVE ZONE II:

These jobs should be completed as you walk back along the trail, but before you finish crossing the Yellojacked Creek bridge.

1. Measure the air temperature, estimate wind speed, and estimate fire danger in the forest as you walk along the trail.

Air temperature =
Wind speed =
Fire Danger =

B. Compare the fire danger at the ponds and in the woods. Are they the same or different? Why do you think they are like this?

2. Next, go to the Yellowjacket Creek bridge. Measure the air temperature and estimate the wind speed here.

Air temperature =
Wind speed =

INVESTIGATIVE ZONE III:

These jobs should be done as you walk back from the Yellowjacket Creek bridge to the Cispus Center.

1. Compare the wind speed and temperatures at the ponds, the forest, and the bridge. Are these measurements the same in all places? Describe your findings and why you think the reasons are for these results.

GOOD WORK METEOROLOGIST!! NOW DISCUSS YOUR FINDINGS WITH YOUR TEAM!

ECOLOGIST

An ecologist is a scientist who studies how living things relate to each other and the environment. As the ecologist in your team, you will study the relationships between organisms and environment in the area (Your job includes all parts of the environment, you may find other members of your team doing jobs much like yours. Work with them!)

GOOD LUCK!

Team name:

Ecologists name:

INVESTIGATIVE ZONE I:

These jobs should be completed in the Yellojacket Ponds area before you start back on the trail.

1. An ecosystem is an area whose inhabitants (living and non-living) interact and depend on each other to survive.

A. Your first job is to map the exosystem of the Yellowjacket ponds area. In your map, you should show: the two ponds, areas covered by grass, areas with trees, the trail and other human additions, and the location of Yellowjacket creek. Add any other parts that you think are imporant.

B. Humans often have a significant effect on an exosystem. Explore the Yellowjacket Ponds area and find four ways that humans have affected it. In the spaces below, describe these impacts (effects), if you find them helpful or harmful, and why.

1. Human impact:
Positive or negative:
Why?:

2. Human impact:
Positive or negative:
Why?:

3. Human impact:
Positive or negative:
Why?:

4. Human impact:
Positive or negative:
Why?:

INVESTIGATIVE ZONE II:

These jobs should be completed as you walk back along the trail, but before you finish crossing the Yellojacked Creek bridge.

1. The activity of one animal can have many effects on the environment. Observe the trees near the creek, as you walk back to the bridge. Some of the trees have clearly been affected by an animal's activity. Go over to the trees and look at what has happened.

A. What animal has done this?

B. Why do you think the animal has done this?

C. Do you think this activity will be good or bad for the ecosystem? Why?

INVESTIGATIVE ZONE III:

These jobs should be done as you walk back from the Yellowjacket Creek bridge to the Cispus Center.

1. Decaying logs are very important to the forest ecosystem. Often called nurse logs, they provide food and homes for many plants and animals. Choose a nurse log that is supporting a variety of life and observe it carefully. Describe what you see, and make a drawing of it in the space below:

GOOD WORK ECOLOGIST ! NOW DISCUSS YOUR FINDINGS WITH YOUR TEAM!

HYDROLOGIST

A hydrologist is a scientist who studies water and water sources (such as lakes, ponds, and rivers). As a hydrologist, you will study the water resources of the area.

GOOD LUCK!

Team name:

Hydrologists name:

INVESTIGATIVE ZONE I:

These jobs should be completed in the Yellojacket Ponds area before you start back on the trail.

1. Water temperature is very important to the life in the pond.

A. Use your thermometer to measure the temperature of the air in the pond area.

Air temperature
at Ponds =

B. Now, measure the temperature of the ponds.

Water temperature
at Ponds =

C. Are the two temperatures the same? What could explain your readings?

2. Not all ponds are the same. You will now observe the differences between the two Yellowjacket Ponds.

A. Look carefully at each of the ponds. Observe the water, plant life, and animal life of the two ponds. Describe any differences that you see:

B. What do you think might explain these differences?

3. Drainage is the way that water flows across the land. You will next observe drainage on two different types of surfaces. Collect two cupfuls of water from one of the ponds.

A. Pour one cup of water onto some soil in the ponds area. What happens to the water poured on the soil?

B. Walk to the blacktop in the parking area. Pour the second cup of water onto the blacktop. What happened?

C. During a rainstorm, what do you think happens to water that falls on soil?

D. During a rainstorm, what do you think.happens to water that falls on blacktop?

INVESTIGATIVE ZONE II:

These jobs should be completed as you walk back along the trail, but before you finish crossing the Yellojacked Creek bridge.

1. A watershed is the area from which water flows into a water source. From the bridge,k observe the surroundings of Yellowjacket Creek. You are looking at part of the watershed of Yellowjacket Creek.
A. How do you think water gets into Yellowjacket Creek?

B. Wher does the water in Yellowjacket Creek go?

C. What could cause the amount of water in Yellowjacket Creek to increase?

D. What could cause the amount of water in Yellowjacket Creek to decrease?

INVESTIGATIVE ZONE III:

These jobs should be done as you walk back from the Yellowjacket Creek bridge to the Cispus Center.

1. As you walk back to Cispus, you will see a trail leading down to the creek. Go down the trail and find a safe place to reach the creek. You will now compare the temperatures of the creek with those of the Ponds.

A. Measure the air temperature near the creek.

Air temperature
at the creek =

B. Now, measure the water temperature of the creek.

Temperature
of Creek water =

C. Is the temperature of the creek water the same as that of the ponds? Give an explanation for your findings.

D. How do you think water temperature affects the living things in the water?

GOOD WORK HYDROLOGIST! NOW DISCUSS YOUR FINDINGS WITH YOUR TEAM!

Conserving Water and Energy

Focus	Activities to increase awareness of the need to conserve energy & water.
Group Size	10 to 40
Time Required	90 minutes
Materials	Poster board, scissors, glue, marking pens, butcher paper, magazines, large bag of MM's, lamp with 100 watt light bulb
Physical Setting	Standard classroom

Process

WARM UP:

1. Give each student 5 MM's and let them eat the candy.
2. Show the lamp and bulb. Turn on the assembly for 36 seconds. Note that one MM's gives you the same amount of energy that is used by the light bulb every 3.5 seconds. Show 10 MM's, drop one in the garbage can approximately every 3.5 seconds until all are gone.
3. Discuss this demonstration with the students. That amounts to 1028 MM's per hour for each light bulb left burning.
4. Ask the students to suggest ways to save (conserve) energy. List these ideas on the board or on poster paper.
5. Ask the students if they know how energy in the form of electricity is made in our state. Encourage suggestions until water power (dams) is brought up. Ask students to suggest ways to conserve water. List those suggestions on the board or poster paper.

TALK/ WRITE:

1. Divide the students into pairs. Place a large piece of poster paper on the wall for each team. Title the pages **Conserving** or **Wasting.** Ask the students to write a two paragraph story about a typical day in which they either conserve or waste energy and water. One student is the writer and on serves as the coach. The coach helps the writer with ideas, spelling, grammar and structure. You may want to narrow their assignment by listing *Before School, before lunch, after lunch, before dinner, before bed* as frames for their story.
2. Allow sufficient time for all to finish. Mingle with the student groups during this part of the assignment, offer suggestions, praise and encouragement.
3. Have each group read their story to the class. Host a discussion about the content when appropriate.

NOTES

POSTERS

1. During the talk write phase, take time to prepare poster boards with titles from their lists on the board about ways to conserve water and energy. Make enough boards so that each team will have one.
2. Handout the poster board and make glue, scissors and magazines available. Instruct the students to find a picture that illustrates the conservation technique.
3. Allow sufficient time for all to finish. Be prepared to help with ideas for pictures. Mingle with the student groups during this part of the assignment, offer suggestions, praise and encouragement.
4. Have each group present their poster to the class. Post the finished results in the classroom, halls or other prominent location.

WRAP UP:

1. Ask the students to explain what they have learned.
   Do they know the meaning of the word conservation?
   What can they personally do the conserve water or energy?
   Ask for a single thing they can do to report to you later.
   Perhaps they could write you a letter and tell you about their successes.

HELP OUR TOWN!

Focus	To introduce some environment-related career opportunities to students.
Group Size	Groups of 12
Time Required	45 minutes
Materials	Game handouts
Physical Setting	Anywhere--indoors or outdoors

Process

1. Begin with a brief discussion of careers related to the environment and methods that communities use to solve environmental problems.

2. Introduce the game and go over the rules with the students. Then you're ready to play! Afterwards, as a class, you can discuss other environmental careers and interests that can lead to these careers.

Rules of Play:

1. This game requires a group of 12 students. In each group of 12 there are four town "mayors" faced with envoirnmental problems in their community, and eight "professionals" with skills in various fields. Depending on the roles they choose, or are given, each student is given the appropriate game card. They should take care not to reveal the information on their card to anyone else, until it is required during play.

2. Students can be seated with mayors facing professionals, or in a circle. Play begins when the first mayor reads his/her problem aloud. Then she/he calls on one of the professionals. The professional can then reveal his/her identity and whether or not she/he can help with the problem (Throughout the game professionals are only identified by their responses. Mayors are challenged to remember their identities--they may not write down notes).

3. If the mayor chooses correctly, she/he may now read his/her town's second problem and search for a professional that can solve it (A new problem can only be addressed when the previous one is solved).

4. If the first mayor chooses incorrectly, the second mayor can begin his/her search for the solution to his/her town's dilemma. The game continues until one mayor finds assistance for all four of the town's problems, or until all the town's find help.

AQUATIC BIOLOGIST

"I am an aquatic biologist. I study the plants and animals of the water. I know how these things live and how they are affected by their environment."

METEOROLOGIST

"I am a meteorologist I study weather and climate. I understand why the weather changes. I also am able to forecast the weather."

GEOLOGIST

"I am a geologist. I study and can identify rocks, soils, and minerals. I also understand how to locate underground resources such as oil and water."

TOXICOLOGIST

"I am a toxicologist. I study and identify harmful substances in the environment."

ENTOMOLOGIST

"I am an entomologist. I study insects. I know how they live, feed, and reproduce. I also understand the effects of insects on plants and animals."

SEISMOLOGIST

"I am a seismologist. I study earthquakes, volcanoes and even human-produced explosions. I understand these events and their effects on the environment."

BOTANIST

"I am a botanist. I understand how plants live, grow, and reproduce. I can also identify and classify different types of plants."

PARK RANGER

"I am a park ranger. I work to maintain and proect parks. I manage wildlife, educate visitors, and make sure people follow park rules."

MAYOR OF TOWN #1

1. There are many fish in our town's river. One type, Striped Bigfish, are very good to eat. Another type, Spotted Smallfish, aren't good to eat or use for bait. The problem we have is that the population of Big fish is decreasing and the population of small fish is increasing. We need help understanding how Bigfish and Smallfish live.

2. A new type of insect has just been found in our town. It is bright blue, can fly, and comes out only at night. We are not sure where this insect came from. We need to know if it will be harmful or beneficial to our community.

3. Community events are a problem in our town. We planned a parade, and it rained. We planned a kite-flying exhibition, and there was no wind. We planned an ice-sculpting contest, and the ice melted. We need someone to help us determine what the weather will be like, so that our community events can be more successful.

4. Our town is located 80 miles away from Mt. Shakey, an active volcano. The volcano's last erupion occurred 100 years ago, but we are always worried that it may happen again soon. We need to understand what is happening in Mt. Shakey so the townspeople won't be unprepared for an eruption, or nervous about one that isn't going to happen.

MAYOR OF TOWN #2

1. People in our town are very excited. The rocks in our town have been found to contain a shiny, yellow metal. Some people say it is gold. Other people say it's only fool's gold--iron pyrite. We want to know if we have struck it rich.

2. Our town is very lucky, because we have many wildflowers in our fields and forests. Everyone is very interested in these flowers. Our problem is that we don't know what to call them, or their scientific classifications. We have tried names like Big Yellow Flower, Small Yellow Flower, and Medium-Sized Yellow Flower, but it was very confusing. We want to give scientific names to our flowers.

3. Wonderjunk Chemical Factory is our town's major industry. It provides many jobs in our town. Ther is a problem at Wonderjunk, however. Many of the employees have a strange disease. Some workers say the chemicals are making them sick. We need to know what is causing the disease.

4. Our town has just opened a big, new park. Everyone agreed that this was a good idea. Now we are not so sure. People walk all over and do not follow trails, cars are parked everywhere (even on flowers and other plants), and there is litter in the places that were supposed to be beautiful. We need to find a way to make sure our park is being properly used and cared for.

MAYOR OF TOWN #3

1. Things in our town are very shaky. Every few years there is an earthquake that causes a lot of damage to our town. People are moving out because of the danger. We need to be able to predict the earthquakes and protect our property and people from their threat.

2. Many people in our town work outdoors. Policemen, construction workers, farmers, and other members of the community need to be comfortable while they're working. They want to know what the weather will be, so they can dress properly. We need to collect and distribute this information to the community.

3. Our town has developed a new industry--honey production. Things are not going well for our new industry; the bees are producing very little honey. Something is wrong in our production set-up. People have suggested that we need different bees. We need to learn more about honey-producing bees to keep our business going.

4. We have just built a new park in our town. It contains a fishpond that people will want to use. In the spring we will stock the pond with fish, but we're having difficulty in deciding what species of fish. We need some that can live in a small area, with slow moving water, are native to the area, and are good to eat. How can we find the right fish?

MAYOR OF TOWN # 4

1. The park in our town has been open for several years. At first, many people went to the park. Now very few go to visit. People enjoy walking around, but they soon become bored. We want someone that can tell visitors about the interesting plants and animals at the park, and show them the different things to see.

2. Our town used to have a very large population of purple-tailed deer. Now the purple-tailed deer are dying. We think some substance in the environment may be causing this. Some people think it is car exhaust, others say it is pollution to the water, and still others think that it's pesticides used by farmers and gardeners. We want to know what is happening to our deer.

3. A new type of plant has been found growing in our town.. So far, the plants are still very small. We don't yet know what they will become: bushes, trees, green or flowering plants. We want to know that kind of plant this is and what, if anything, we need to do about it.

4. Our town is running out of water and we need to dig new wells. There is a lot of rock under the ground in out town. It is very difficult to drill through this rock. Some people say it's a waste of time to try to dig the wells. We want to know what type of rock we'll be drilling through, and if there will be water underneath it.

NOWHERE IS AWAY

Focus

To illustrate that we live in a closed system, that any pollutant discarded into the environment has to go somewhere, and the potential hazards of these pollutants to the environment and its inhabitants.

Group Size

30 Students

Time Required

2 hours (*May be combined with **BLOWN AWAY***)

Materials

Human resource: Bruce Haney, Toxicologist **BE SURE TO ARRANGE, THROUGH CISPUS STAFF, ONE WEEK IN ADVANCE FOR MR. HANEY'S PRESENTATION.**
Field journal
12" x 18" x 3" pan or foil covered(*inside*) box lid
1 gallon of sandy soil (*available from soil pit near trailer #10*)
food coloring
1 quart of water

Physical Setting

Standard Classroom (*discussion*)
Beaver Ponds on Bruce Haney's property

Process

ACTIVITY 1: IN THE CLASSROOM

1. Dump the soil into one end of the pan and allow to slope down, leaving 4-6 inches uncovered. Sprinkle several tablespoons of food coloring over the soil. Tilt the dirt-filled end of the pan up 2-3 inches and sprinkle water over the soil until it leeches through and drains to the bare end of the pan. Have the students note the color of the water accumulating at the end of the pan.
2. Present Bruce Haney, toxicologist who will discuss the effects of putting wastes into the environment.
3. Students will take field notes of observations from the soil leeching demonstration and Mr. Haney's presentation.

Note: The lesson, ***BLOWN AWAY***, also involves Mr. Haney and a visit to his property. Combining these lessons will save approx. 1 hour in travel time.

ACTIVITY 2: IN THE FIELD

1. Students will walk to Bruce Haney's property (about .1 mile) to observe potential ecological effects of spraying defoliants onto hillsides adjacent to water sources or wetland wildlife habitats.
2. Mr. Haney will discuss his experience with this and other types of environmental polluting.
3. Students will take field notes of their observations and draw conclusions discussing 5 possible effects of the use or disposal of pollutants into the environment.

ACTIVITY 3:

1. Students will journalize one lesson which they have learned today and discuss how this impacts their life in a way which they had'nt realized.

TREES AND TIMBER

Focus To examine the issue of logging and forests in the Pacific Northwest.

Group Size Entire class

Time Required 2 hours

Materials TV/VCR
Videos: ***"The Trees go on Forever"***
"Rage Over Trees"

Physical Setting Indoors for videos and discussion, Cispus area and Quartz Creek Big Trees for follow-up visits

Process

1. Start a brief preliminary discussion on forest use in the Pacific Northwest.

2. Show "***The Trees go on Forever***" (15 min), a video produced by Weyerhaeuser that gives the timber industry viewpoint. And "Rage Over Trees" (50 min), produced by the Audubon Society, this video follows the environmentalist viewpoint (Note the difference in running times. You may wish to counteract this by showing the shorter video second).

3. Discuss the videos. The questions included in the folowing pages may be used to facilitate the discussion.

4. Follow-up visits can be made to Quartz Creek Big Trees (see "***KING OF THE FOREST***" activity), clear cut, and second growth forests in the Cispus area.

Discussion Questions

1. "The Trees go on Forever", began by showing farm fields and orchards. Why was this done? Is this comparison (agricultural corps = forest) a good or accurate one?

2. Environmentalists want to preserve old growth forests in their "natural" state. They also would like to use these forests for caming, hiking, researching, hunting, and fishing. Are these human activities "natural" in the old growth forest? Is it "natural" for forests to be protected?

3. The focus of "Rage Over Trees", was old growth forests. "The Trees go on Forever", discussed old growth briefly. Why did the two films address old growth forests in such different ways?

4. What roles are played by the U.S. Government in deciding what will happen to the forest?

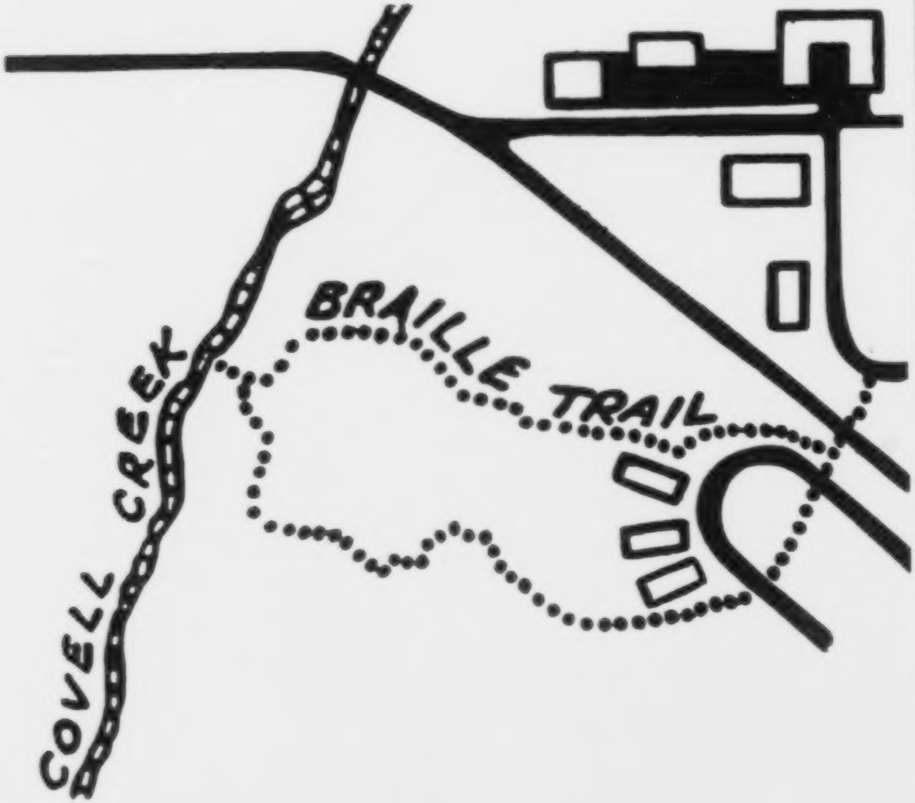
5. Do you think our forests would be better managed by small timber conpanies (as seen in "Rage Over Trees"), or by large timber companies (such as Weyerhaeuser)? What are your reasons for this decision?

6. In "Rage Over Trees", the cutting of forests in the Pacific Northwest was compared with the deforestation in the rainforest of South America. Are these two situations the same? Should people in the U.S. try to influence how forests are manages in other countries?

7. Several people in "Rage Over Trees", suggested that Congress or "the will of the people" what happens to our forests. In this way the majority would have control. Do you think using the most popular viewpoint is a good way to decide forest management policy?

8. In "Rage Over Trees", members of the timber industry were brought together with environmentalists. Do you think the two sides really listened to each other? What effect will this have on solving the problem of forest use?

Braille Trail Today


BRAILLE TRAIL
COVELL CREEK

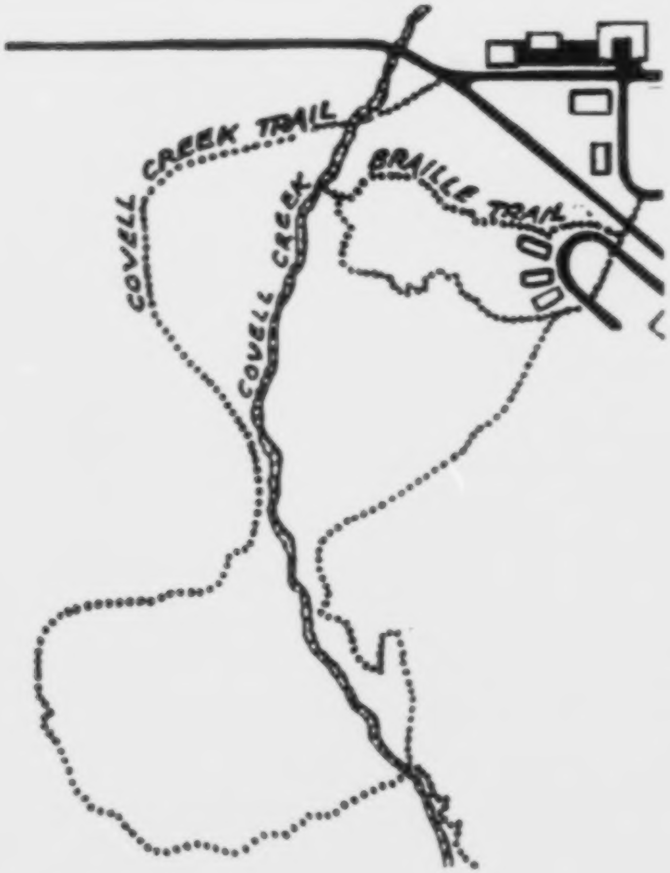
Legend

Evergreen Stands
Deciduous Groves

Fallen logs
Benches
Nurse Logs
Erosion areas
Numbered stops

Sightings:

Sites and Sightings along the Covell Creek Trail


COVELL CREEK TRAIL
COVELL CREEK
BRAILLE TRAIL
COVELL CREEK

Legend

Evergreen Stands
Deciduous Groves
Devils Club
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Shelter
Burned Out Tree
Large Nurse Log
Cut Away Bank
Abandoned Survival Shelter
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Sightings: